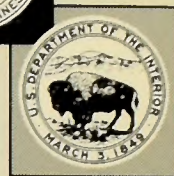


Availability of Federally Owned Minerals for Exploration and Development in Western States: Idaho, 1988



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Availability of Federally Owned Minerals for Exploration and Development in Western States: Idaho, 1988

By Paul C. Hyndman, James Ridenour, W. Dean Crandell,
and Clayton M. Rumsey

UNITED STATES DEPARTMENT OF THE INTERIOR
Manuel Lujan, Jr., Secretary

BUREAU OF MINES
T S Ary, Director

Mission: As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally-owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration.

CONTENTS

	<i>Page</i>
Abstract	1
Introduction	2
Objectives	2
Previous studies	2
Acknowledgements	3
Scope and methods	4
Inventory of Federal mineral ownership and management practices	4
Compilation of mineral resource and production information	5
Incorporation of Geographic Information System techniques	6
Ownership and management of Federal mineral land	6
Applicable Federal laws, regulations, and policies	8
Availability of Federal mineral lands for exploration and development	9
Acquired lands	9
Reconveyed lands	11
Mineral estate reserved to the United States	12
Areas of past mineral production and identified resources	12
Geographic and geologic setting	13
Mining history	14
Mineral production and identified resources	15
Locatable minerals	15
Silver	15
Gold	15
Base metals	15
Molybdenum	15
Antimony	15
Other locatable minerals	15
Leasable minerals	15
Phosphate	15
Oil and gas	19
Geothermal water	19
Other leasable minerals	19
Spatial relationship of Federal mineral availability with known mineral deposit areas	20
Summary	22
References	23
Appendix A.—Glossary	25
Appendix B.—Guidelines for mineral use restraint categories on Federal lands, prepared by the Bureau of Mines	28
Appendix C.—Guidelines for mineral use restraint categories on Federal lands, prepared by the Interagency Land Withdrawal-Inventory Task Force	32
Appendix D.—Availability of Indian lands	35
Appendix E.—Major Federal laws affecting mineral exploration and development	36
Appendix F.—Availability of Federal land in Idaho by agency	41
Appendix G.—Significant mineral deposits	45
Appendix H.—Annual price and production for gold, silver, copper, lead, and zinc in Idaho (1863-1988)	53

ILLUSTRATIONS

1. Aggregated areas affected by mining of gold, silver, copper, lead and zinc in the Western States	3
2. Overview of ILURP process	4
3. Land status in steps	5
4. Steps for KMDAs and final products	6

ILLUSTRATIONS

	<i>Page</i>
5. Ownership of mineral lands and Federal managing agency distribution in Idaho	7
6. Locatable and leasable mineral lands in Idaho	10
7. Mines active in Idaho in 1988	13
8. Silver value and production in Idaho, 1863-1988	16
9. Gold value and production in Idaho, 1863-1988	17
10. Lead and zinc value and production in Idaho, 1863-1988	18

PLATES

1. Availability of Federal mineral land compared with known mineral deposit areas for selected locatable minerals in Idaho
2. Availability of Federal mineral land compared with known mineral deposit areas for selected leasable minerals in Idaho

TABLES

1. Management of Federal mineral lands by agency in Idaho	8
2. Federal mineral lands by agency and category of restriction	11
3. Federal mineral estate and reserved interests	12
4. Mines active in Idaho in 1988	13
5. Summary of known mineral deposit areas compared with Federal mineral lands in Idaho	20
6. Comparison of Federal mineral availability and known mineral deposit areas	21
B-1. Mineral use restraint guidelines	28
B-2. Mineral use restraints identified in Idaho	30
C-1. Mineral use restraint guidelines prepared by the Interagency Task Force	32
C-2. Availability of Federal mineral land in Idaho (Interagency Task Force definitions)	34
D-1. Indian reservations in Idaho	35
F-1. Federal mineral lands managed by the Bureau of Land Management in Idaho	41
F-2. Federal mineral lands managed by the Forest Service in Idaho	42
F-3. Federal mineral lands managed by the Department of Defense in Idaho	43
F-4. Federal mineral lands managed by the Fish and Wildlife Service in Idaho	43
F-5. Federal mineral lands managed by the National Park Service in Idaho	43
F-6. Federal mineral lands managed by other Federal agencies in Idaho	44
G-1. Mineral production and/or identified resources used to estimate boundaries of known mineral deposit areas for selected locatable minerals	45
G-2. Mineral production and/or identified resources used to estimate boundaries of known mineral deposit areas for selected leasable minerals	52
H-1. Idaho production of gold, silver, copper, lead, and zinc: 1863-1988	53
H-2. Average price of gold, silver, copper, lead, and zinc: 1863-1988	55

UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

bbl	barrel	st	short ton
°C	degree Celsius	tr oz	troy ounce
ft	foot	\$/lb	dollar per pound
ft ³	cubic foot	\$/tr oz	dollar per troy ounce
oz	ounce		

Other Abbreviations and Acronyms

ACEC	Area of critical environmental concern	INS	Immigration and Naturalization Service, U.S. Department of Justice
BIA	Bureau of Indian Affairs, U.S. Department of the Interior	KGRA	Known geothermal resource area
BLM	Bureau of Land Management, U.S. Department of the Interior	KMDA	Known mineral deposit area
BOR	Bureau of Reclamation, U.S. Department of the Interior	MAS	Minerals Availability System, Bureau of Mines
CFR	Code of Federal Regulations	MILS	Mineral Industry Location System Bureau of Mines
COE	Corps of Engineers, U.S. Army, (U.S.) Department of Defense	MTP	Master Title Plat
DOD	(U.S.) Department of Defense	NFS	National Forest System
DOE	(U.S.) Department of Energy	NPS	National Park Service, U.S. Department of the Interior
EIS	Environmental Impact Statement	NSMMPAC	National Strategic Materials and Minerals Program Advisory Committee
EROS	Earth Research Observation Satellite	NWPS	National Wilderness Preservation System
FAA	Federal Aviation Administration, U.S. Department of Transportation	PLS	Public Land Survey
FHWA	Federal Highway Administration, U.S. Department of Transportation	RMP	Resource Management Plan
FLPMA	Federal Land Policy and Management Act of 1976	SES	Sheep Experiment Station, U.S. Department of Agriculture
FS	Forest Service, U.S. Department of Agriculture	URA	Unit Resource Analysis
FWS	Fish and Wildlife Service, U.S. Department of the Interior	U.S.C.	United States Code
GAO	(U.S.) General Accounting Office	USGS	U.S. Geological Survey, U.S. Department of the Interior
GIS	Geographic Information System	VA	Veterans Administration
ILURP	Inventory of Land Use Restraints Program	WSA	Wilderness Study Area

AVAILABILITY OF FEDERALLY OWNED MINERALS FOR EXPLORATION AND DEVELOPMENT IN WESTERN STATES: IDAHO, 1988

By Paul C. Hyndman,¹ James Ridenour,² W. Dean Crandell,³ and Clayton M. Rumsey⁴

ABSTRACT

The U.S. Bureau of Mines inventoried Federal mineral lands in Idaho and classified them in detail, section by section, according to their availability for mineral exploration and development as affected by legal restrictions and agencies' management practices. The Bureau also identified known mineral deposit areas (KMDAs) and areas conducive to oil, gas, and geothermal resources. This information is shown on maps (developed in part by geographic information system technology) that spatially compare the availability for mineral entry of Federal land with these KMDAs to demonstrate the extent and severity of restrictions on mineral entry. Idaho contains 53.1 million acres, 35.7 million (67%) of which is Federal mineral land. About 7 million acres of this land is within KMDAs that host medium- to high-value locatable mineral deposits; 36% of this land is available, 27% is slightly to moderately restricted, and 37% is severely restricted or unavailable. For the leasable minerals, about 1.8 million acres are within KMDAs that host medium- to high-value phosphate deposits, about 5.4 million acres are favorable for oil and gas resources, and 3.9 million acres for geothermal resources. The percentages of land availability are 30%, 45%, and 25% for the phosphate acreage, 38%, 34%, and 28% for the oil and gas acreage, and 43%, 30%, and 27% for the geothermal acreage.

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INTRODUCTION

Federal lands,⁵ which are largely in the Western States and comprise nearly one-third of the United States, are a vital and important source of raw mineral materials for the Nation.

To ensure that Federal lands and their many resources are managed in the public interest, numerous laws, regulations, policies, and management practices have been implemented to preserve or protect a variety of nonmineral resources. As a result, large quantities of Federal lands have been set aside (withdrawn) legally or managed so as to restrict the exploration and development of mineral resources. These actions have led to a growing concern that the attrition of Federal mineral lands available for exploration and development adversely affects the availability of raw material necessary for maintaining the domestic economy.

In 1982, the President's National Materials Program Plan and Report to Congress identified the need to estimate the extent of Federal mineral lands available for exploration and development. The U.S. Bureau of Mines, in response, initiated a State-by-State Inventory of Land Use Restraints Program (ILURP) for the eleven Western States and Alaska. Data for each State are compiled and interpreted to determine the cumulative effects of legislative and discretionary withdrawals on the availability of Federal mineral lands. This data is geographically compared with known mineral deposit areas (KMDAs). The results of these studies assist managers and decision makers in land use planning by depicting cumulative effects of withdrawals and decisions on mineral access to areas having known mineral resources.

OBJECTIVES

The Bureau of Mines mission is to help ensure the United States has an adequate supply of nonfuel minerals to meet economic and defense needs at acceptable social, environmental, energy, and economic costs. In support of this mission, the Bureau is conducting a State-by-State ILURP of the 11 Western States. The Bureau also conducted six regional studies of Alaska. The resulting reports generally include 1:500,000 scale maps that illustrate KMDAs superimposed on Federal mineral lands, which allow the user to recognize areas of overlap. As this national program progresses, the cumulative effect of withdrawals and other restrictions on access to the Federal mineral estate in the 11 Western States and Alaska will become evident. This report describes the results of the study for Idaho.

PREVIOUS STUDIES

In 1970, the congressionally appointed Public Land Law Review Commission submitted its final report (21),⁶ which provided the first comprehensive review of Federal land laws, regulations, and policies. Among the Commission's concerns were the availability of mineral deposits on Federal mineral lands for exploration and development, a general review of lands excluded from mineral entry, and the justifications for such exclusions. Among its conclusions and recommendations pertaining to the availability of minerals were the following:

1. Public-land mineral policy should encourage exploration, development, and production of minerals on the public lands.
2. Mineral exploration and development should have preference over some or all the other uses on much of our public land.
3. Before mineral activities in an area are precluded by statute, Federal agencies should conduct mineral examinations to provide reliable information concerning their mineralization.
4. A program should be established to determine the extent of mineralization of public land where mineral activities are presently excluded but mineralization appears likely.

Bennethum and Lee (3) concluded that in 1974, 67% of all Federal land was excluded from location of mining claims and 73% was similarly withdrawn or restricted from leasing. A subsequent report by a task force of the Department of the Interior (29) reassessed the availability of land in greater detail, but neither it nor Bennethum and Lee addressed detailed geographic relationships between the status and accessibility of Federal mineral lands and KMDAs.

The public minerals sector was also taking note of the growth of Federal withdrawals. Ohle (20) presented a picture (fig. 1) of the cumulative land that metal mining physically impacted in the Western States as of 1975. The squares in each State represent the collective acreage of all areas that had been affected by mining activities for gold, silver, copper, lead, and zinc.

A 1979 report by the Office of Technology Assessment (27) analyzed Federal land management laws and practices governing mineral exploration. While it presented no detailed analysis of conflicts by geographic locality, it

⁵This and other terms may not be familiar and are in appendix A.

⁶Italic numbers in parentheses refer to items in the list of references at the end of this report.



Figure 1.—Aggregated areas affected by mining of gold, silver, copper, lead and zinc in the Western States. Source: Ohle (20).

included a generalized map showing areas of conflict between base and precious metal mining districts in relation to Federal natural, scenic, and recreation areas.

In 1980, the Bureau completed a report (24) that described the extent of withdrawals and other restrictions regarding mineral development on the Federal mineral estate within the Overthrust Belt of Idaho, Montana, Utah, and Wyoming. The report described the geology and mineral resources to indicate the potential for mineral development but presented no spatial relationship between availability of minerals and their potential for development.

A 1981 study by the General Accounting Office (GAO) (7) addressed availability of Federal mineral lands with regard to onshore oil and gas leasing and the progress made in eliminating unnecessary withdrawals through the Federal Land Policy and Management Act (Public Law 94-579) withdrawal review process. The report listed total acreage by land use type that was closed to onshore leasing by legal or administrative withdrawal and acreage totals, by State, of lands prospectively valuable for oil and gas.

Another GAO report (8), issued in 1982, presented the number and type of Federal withdrawals, including de facto withdrawals, and their respective acreage in detail. However, it made no attempt to correlate the withdrawn lands with lands having known mineral resources.

All of these studies recognized (1) the importance of public lands in providing minerals essential for current and future needs, (2) that mines must be developed where concentrations of minerals occur in nature, and (3) that mineral production requires relatively small amounts of acreage. Most of these studies reviewed the legal framework for mineral exploration and development and identified the major legal and philosophical conflicts. Except for limited examples or with generalized maps, the studies did not address the critical issue of the spatial relationship between KMDAs and restricted areas (the collective withdrawals and restrictions on public lands). The emphasis of the ILURP reports is on the spatial relationship between KMDAs and the availability of the public lands.

The ILURP study of the State of Washington (1), published in 1984, was the first of this series of studies by the Bureau. Report have also been published for Arizona (19), Colorado (2) Nevada, (9) New Mexico (12, 13), Oregon (15), and Alaska (4-6, 17, 18, 23). Studies of Utah and Wyoming and a special study on the California Desert Conservation Area in southern California are in progress; these will be followed by a study of Western Montana.

ACKNOWLEDGEMENTS

The Bureau is grateful for the assistance of many people in the numerous land-management agencies contacted during the course of this study, and in particular, Sharron Deroin and Dave Schmidt at the Bureau of Land Management (BLM) Idaho State office. The authors wish to thank Eugene Fosnight, cartographer, and Michael Madigan, computer analyst, at the EROS Data Center, U.S. Geological Survey (USGS), Sioux Falls, SD, for their transfer of GIS technology to the Bureau, their creation of the digital, section-level base map of Idaho, and the

computer analysis of the land status and known mineral deposit areas. The Bonneville Power Authority contributed digital hydrography, and the Idaho Division of Water Resources contributed digital land survey maps. The authors also wish to thank the following Bureau personnel for their various contributions to the successful completion of this study: Ted Brandt, cartographer; Nancy Babcock, Carol Doering, and Larry Reigel, computer technicians; Don Capstick, Mike Dunn, Gerry Klett, and Mitch Linne, physical scientists.

SCOPE AND METHODS

This report is composed of three parts: (1) an inventory of all lands in Idaho to identify the Federal mineral lands and their availability for exploration and/or development; (2) an assessment of KMDAs in the State; and (3) a comparison of the availability of the Federal mineral lands with these KMDAs. An overview of the ILURP process is shown in figure 2.

INVENTORY OF FEDERAL MINERAL OWNERSHIP AND MANAGEMENT PRACTICES

The BLM Master Title Plats (MTPs) and Federal agency land management plans, such as Resource Management Plans (RMPs), Environmental Impact Statements (EISs), and Unit Resource Analyses (URAs), were utilized as the primary sources of information for determining the availability of Federal mineral lands for exploration and

development. Specific information on withdrawals was obtained from the BLM "Withdrawal Review Inventory" and from a canvass of other Federal agencies responsible for managing lands and minerals. Other sources included interviews with managers and staffs of the land-managing agencies, State reports, and special studies (e.g., lists of threatened and endangered flora and fauna, and of archeological sites).

The MTPs provided the majority of information necessary to compile detailed maps of ownership and to identify the legal availability of Federal mineral lands. Various agency management plans and interviews with staffs of local land-managing units provided the majority of information to determine the management availability status of the Federal mineral lands. This voluminous amount of information, reflecting the status of ownership and availability, was compiled and coded on the MTPs. The

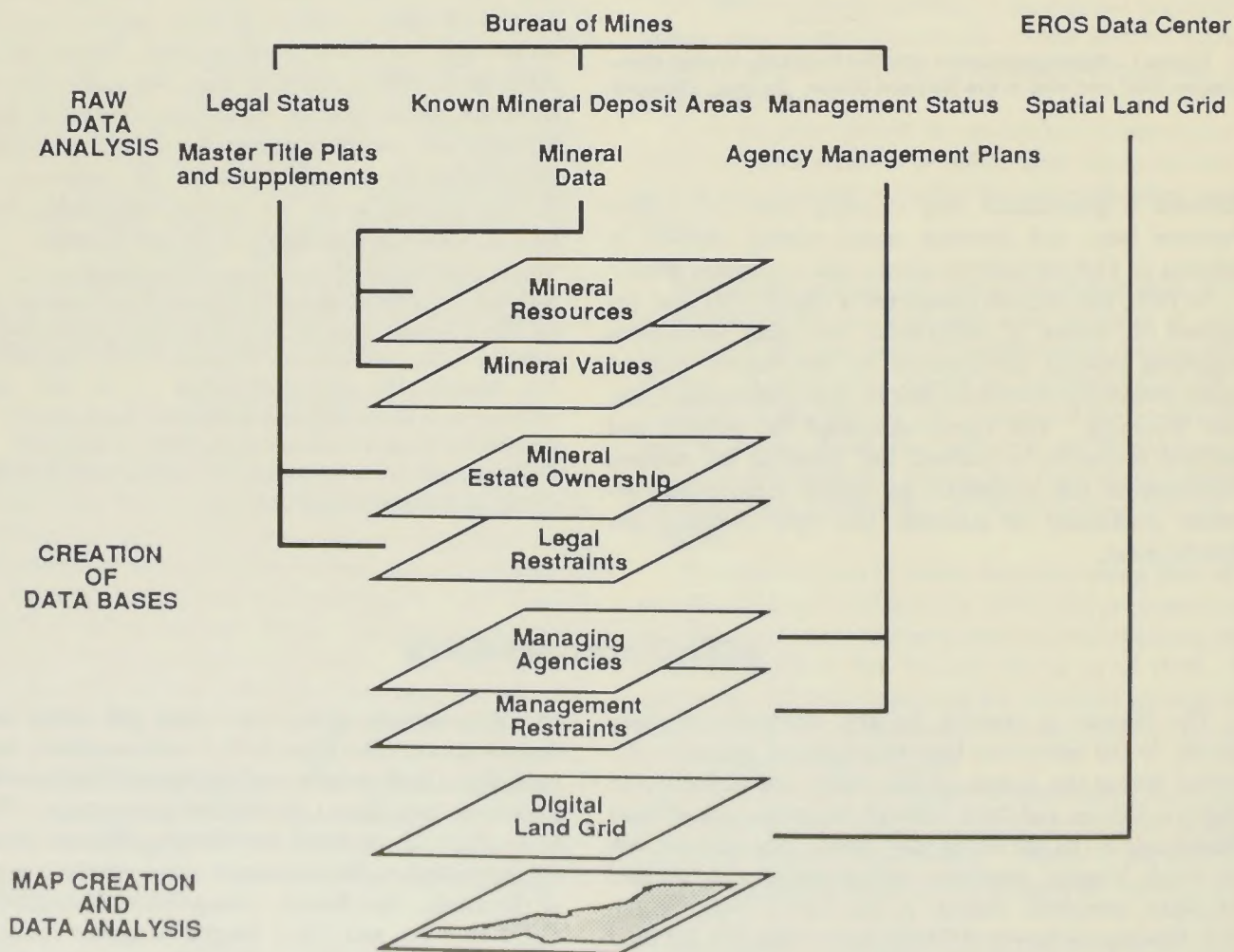


Figure 2.—Overview of ILURP process.

coded data were then entered into computer data bases providing the basic documentation and backup compilation for this report (fig. 3). The data are available for inspection at the Western Field Operations Center.

Federal mineral lands are classified according to (1) whether the restriction results from legal action or management decision, and (2) the degree of availability, depending on how the restriction and severity may affect exploration for and development of minerals. A detailed list of categories of restrictions and their practical effects, as interpreted by the Bureau, is given in appendix B; appendix C presents categories important to the Inter-agency Land Withdrawal-Inventory Task Force.

The Bureau's definition of practical effects is discussed in detail in the section titled "Availability of Federal Mineral Lands for Exploration and Development."

A base map of the State, at a scale of 1:500,000, was selected to display Federal mineral lands and the Bureau's assessment of Federal mineral status based on the practical effects of withdrawals and management practices. Federal mineral status shown on plates 1 and 2 (envelope) is stylized to show sections (usually 640 acres) of the public land survey as the smallest displayable units of ownership. Federal ownership of the mineral estate of one-half or more of a section shows as Federal ownership of the entire section; sections with less than one-half Federal mineral ownership are shown as being non-Federal for the entire section.

The status of the availability of Federal mineral lands is also displayed by predominance. For a section identified as dominantly Federal in ownership, if one-half of the acreage of the Federal mineral estate is available, and the other half is unavailable, the entire section is shown as unavailable. The method of predominance results in a bias on the plates toward the more restrictive status along the boundary of areas of different status. However, each distinct parcel of each section was identified as to acreage,

managing agency, and types of restrictions it contained. The acreage figures of the status in various tables of this report reflect the actual status of all parcels in the State and not the predominant status.

Federal mineral lands on the plates are color coded to reflect the degree of restriction status; green indicates available, yellow indicates slight to moderate restrictions, and red indicates severe restrictions or unavailable. Solid yellow or red colors indicate that legal withdrawals are dominant. Diagonal lines on these colors indicate that management actions are dominant.

The status of Federal mineral lands in this report represents the Bureau's assessment as of early 1988; changes undoubtedly have occurred since then. Although the information on status is generally accurate, interested parties should refer to the official BLM records or to other managing agencies for the current status of specific Federal land.

COMPILATION OF MINERAL RESOURCE AND PRODUCTION INFORMATION

All lands in Idaho, without regard to mineral ownership, were evaluated for the presence of known mineral resources. The areas with resources were classified and grouped into KMDAs based on (1) the cumulative value of production and/or identified resources, (2) the distribution of deposits within mineral-bearing terranes, (3) economic and geologic principles, and (4) professional judgment (fig. 4). Each KMDA includes areas where mineral deposits, occurrences, and productive areas are dispersed. Mineral resources in a KMDA may be low in grade and/or broad in areal extent. Not all mineral resources could be represented by a KMDA because (1) the available information was insufficient to determine the value of production and/or resources, (2) their areal extent may have been too small to represent on the plates, or (3) their

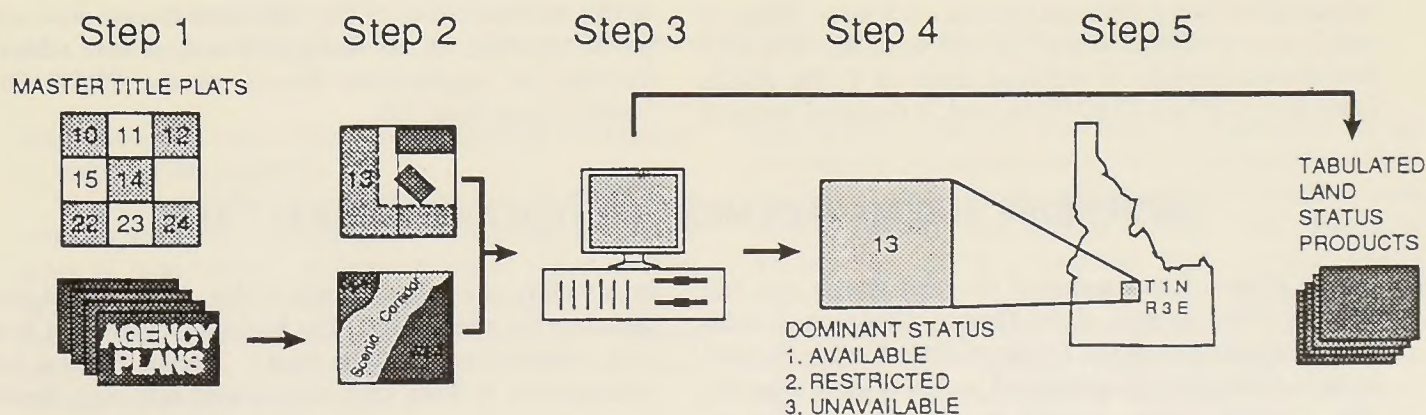


Figure 3.—Land status in steps.

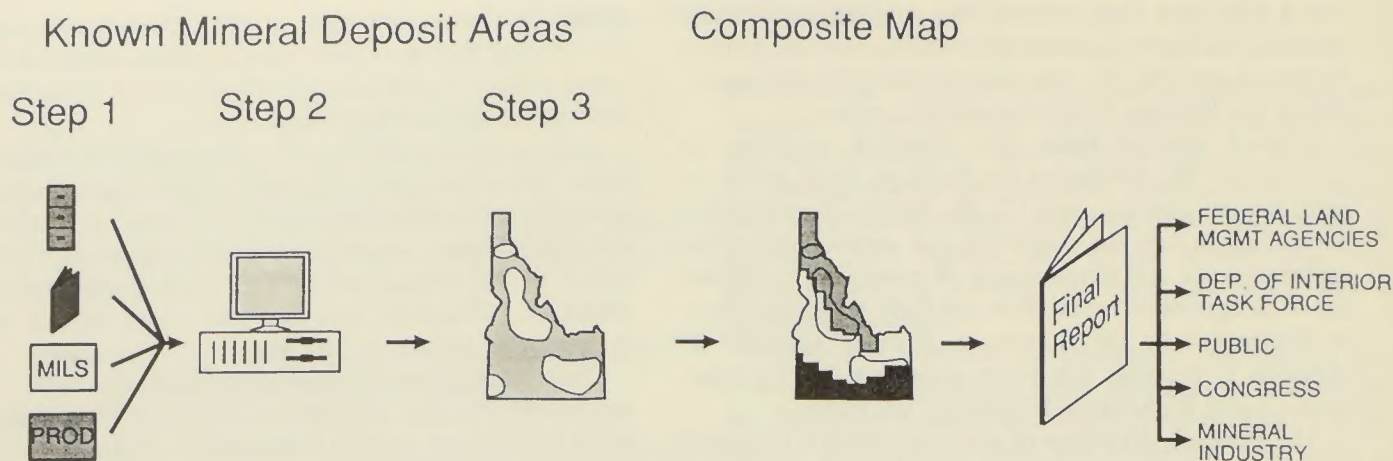


Figure 4.—Steps for KMDAs and final products.

locations were considered confidential by the owners. Sources of information include production and resource data from Bureau files, Minerals Availability System (MAS) reports and records (including the Mineral Industry Location System (MILS) database), Mineral Land Assessment reports, and other sources. The data used to identify KMDAs is available for public inspection unless it is confidential.

The geographic relationships between the status of Federal mineral lands and locatable mineral areas are shown on plate 1, and leasable mineral areas are shown on plate 2. The specific relationships with regard to KMDA acreage, resource categories, and the status of mineral lands are described later in this report.

INCORPORATION OF GEOGRAPHIC INFORMATION SYSTEM TECHNIQUES

A geographic information system utilizes computer technology and graphics to create maps and analyze relationships between different themes on a map. Plates 1 and 2 were composed in part by GIS methods. The GIS contribution consists of digitized maps of 1) the Public Land Survey (PLS), 2) KMDAs, and 3) potential areas of

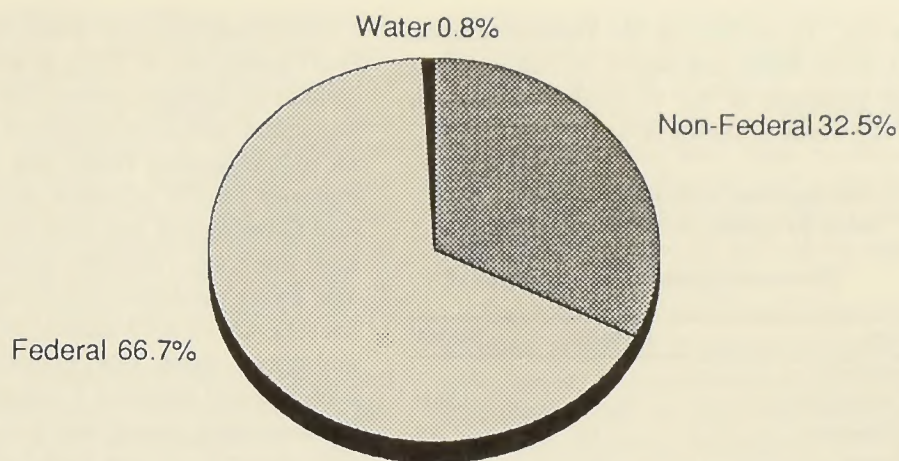
certain leasable minerals. The section boundaries of the PLS and the State boundary represents the base theme. The KMDA boundaries also represent a theme, the areas with known mineral deposits. The potential areas of certain leasable minerals represent another theme. The ownership of the mineral estate in each section of the PLS, Federal or non-Federal ownership, represents a fourth theme. The availability status for each section of the PLS regarding locatable minerals and the availability status regarding leasable minerals represent additional themes. The spatial comparison of these themes allows quantitative relationships to be identified. The KMDAs are overlaid onto the Federal mineral estate to determine where and how much of the KMDAs occur in the estate. The KMDAs that are in the Federal mineral estate are then overlaid onto the availability status to determine how the KMDAs are affected by legal and management restrictions. The relationships of the potential areas of certain leasable minerals with the Federal mineral estate and availability status parallel that of the KMDAs. The collective representation of the individual themes into composite maps (fig. 4), and the spatial analysis were achieved through the Applications Branch of the EROS Data Center, Sioux Falls, SD.

OWNERSHIP AND MANAGEMENT OF FEDERAL MINERAL LAND

The United States acquired the land that is now the State of Idaho as part of the Oregon Compromise with Great Britain through the Treaty of 1846. Certain Federal lands in Idaho, usually sections 16 and 36 of each township plus quantity grants, passed to the State under its Indemnity Lands and Permanent School Fund Act. Other Federal land was sold to homesteaders and military veterans, granted to railroad corporations, and disposed of

by a variety of sales or entries under Federal land laws, including the mining laws. The Federal Government, however, retained most of the land.⁷ Recent Federal land management policies have emphasized retention, limited

⁷Indian lands (appendix D), held in trust by the Federal Government for the benefit of the individual tribes, are considered as private lands.



Mineral Lands in Idaho

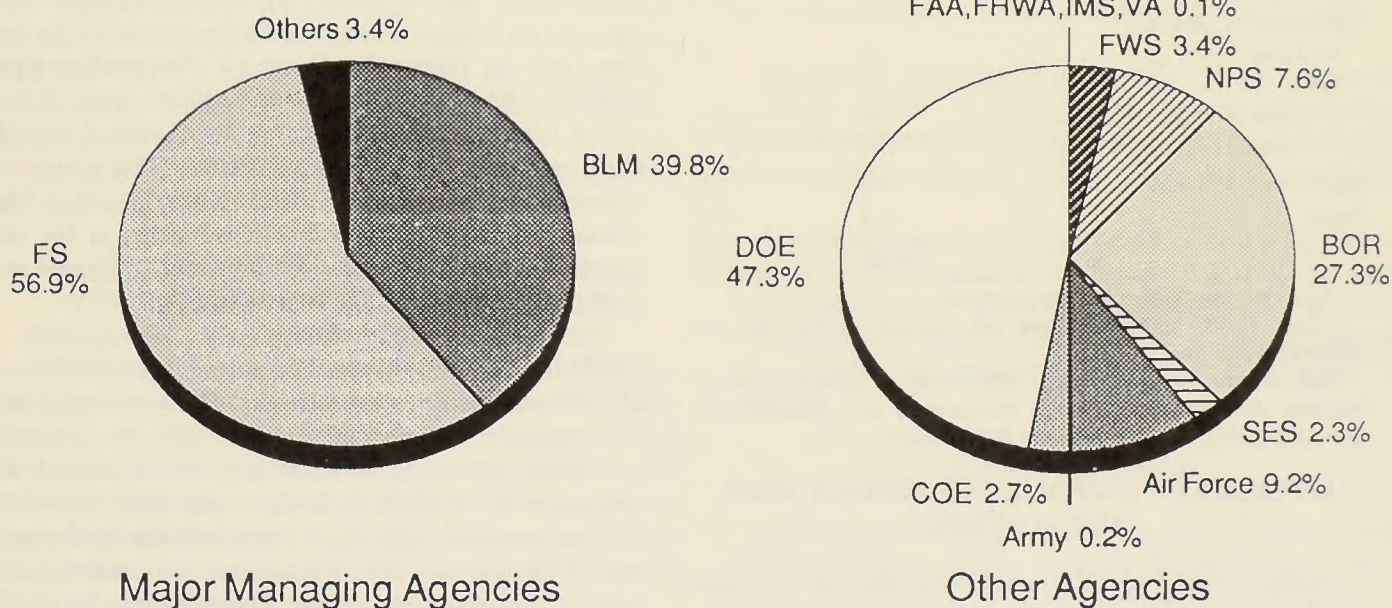


Figure 5.—Ownership of mineral lands and Federal managing agency distribution in Idaho.

acquisition, and more intensive management for multiple or single public purposes.

Idaho, the twelfth largest State by area in the Nation, contains about 53.1 million acres of land and 0.4 million acres of land beneath permanent inland water surfaces such as lakes, reservoirs, ponds, and rivers (28). Approximately 35.7 million acres (67%) of Idaho are Federal mineral lands (fig. 5), including 2.3 million acres with non-Federal ownership of the surface.

On the basis of management responsibilities, 2 of the 14 Federal agencies in Idaho manage most of the Federal

mineral lands (fig. 5). The BLM is responsible for approximately 14.2 million acres (40%), and the Forest Service (FS) is responsible for approximately 20.3 million acres (57%). The Fish and Wildlife Service (FWS), Bureau of Reclamation (BOR), National Park Service (NPS), Department of Defense (DOD) including the Corps of Engineers (COE), Department of Energy (DOE), Sheep Experiment Station (SES), Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Immigration and Naturalization Service (INS), and the Veterans Administration (VA) manage the remaining

1.2 million acres (fig. 5), or 3%, of the Federal mineral lands. The data upon which this report is based reflect only the mineral interests of the Federal Government. Management of the lands is shown in table 1.

Table 1.—Management of Federal mineral lands by agency in Idaho

(Thousand acres)

Agency	Acreage ¹	Percent
Department of the Interior:		
Bureau of Land Management . .	14,217	39.8
Fish and Wildlife Service	41	0.1
National Park Service	91	.3
Bureau of Reclamation	² 327	.9
Subtotal	14,676	41.1
Department of Agriculture:		
Forest Service	20,317	56.9
Sheep Experiment Station	28	<.1
Subtotal	20,345	56.9
Department of Defense:		
Air Force	110	.3
Army	2	<.1
Corps of Engineers	32	<.1
Subtotal	144	.4
Department of Energy	568	1.6
Other ³	<1	<.1
Total	35,733	100.0

¹Acreage from Bureau in-house tabulation.

²About 19,000 additional acres are included in the Fish and Wildlife Service total.

³Includes the Federal Aviation Administration (239.45), Federal Highway Administration (24.15), Immigration and Naturalization Service (386.41), and the Veterans Administration (110).

APPLICABLE FEDERAL LAWS, REGULATIONS, AND POLICIES

Availability of Federal mineral lands for exploration and development is determined mainly by Federal laws, regulations, and management practices. A list of the major Federal laws is presented in appendix E.

Rights to Federal minerals are obtained by location, lease, or sale, depending upon the mineral and the type of Federal land involved. Most minerals may be obtained by locating and perfecting mining claims under the General Mining Law of 1872, as amended. Locatable minerals include all metallic and many nonmetallic minerals. Although the Federal Government has little discretion concerning where locatable minerals are claimed on Federal land open for location, agencies that manage the land do exercise a certain amount of control, under existing Federal regulations, over subsequent exploration and development.

Some minerals are available for lease under the Mineral Leasing Act of 1920, as amended. Leasable minerals include oil and gas, geothermal steam, phosphate, sodium, potassium, sulfur in Louisiana and New Mexico, and coal on public domain lands, and all minerals except salable minerals on the acquired lands. If necessary, the Federal Government can limit the rate of extraction of leasable minerals. Certain specified minerals available by sale under the Materials Act of 1947 and the Surface Resources Act of 1955 include the common varieties of sand and gravel, stone, clay, pumice, and cinders. The sale of such mineral material is entirely within the discretion of the managing agency and is subject to tight control. Salable minerals are not included in this study because they are widespread and readily available in most places. For these minerals, availability of Federal mineral lands is generally not a problem.

Specific laws, regulations, and management practices of Federal agencies govern the availability of land under their jurisdiction. The Wilderness Act of 1964 required Federal agencies to inventory their lands for suitability for inclusion into the National Wilderness Preservation System (NWPS). Idaho contains about 3 million acres of inventoried lands that await decisions by Congress regarding their possible inclusion into the NWPS. This acreage represents about 8% of the Federal mineral lands in Idaho. About 10% of the Federal mineral lands in the State, 3.7 million acres, is legally withdrawn as wilderness and is part of the NWPS.

The Federal Land Policy and Management Act (FLPMA) of 1976, and the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, are comprehensive statutes directing the BLM and FS, respectively, in the management of Federal lands under their jurisdiction. Each agency has established a multiple-use land planning system through which land managers can control development of resources and ensure compatibility with land use plans and environmental protection. The BLM has the authority to regulate mining and mineral leasing activity on all onshore Federal lands, and the FS has authority to manage the surface resources on lands that it administers. The FS also has consent authority on leasing decisions on FS lands. Each agency has published regulations designed to minimize adverse environmental impacts on surface resources that may result from activities under the General Mining Law of 1872. Mineral leases are subject to stipulations for the protection of various resources; these stipulations may vary from "standard" to highly restrictive. Applications for leases and sales of mineral material may be denied at the discretion of the Secretary of the Interior or the Secretary of Agriculture as delegated.

Land use planning documents indicate management practices for specific areas of Federal land and show where mineral-related activity will be restricted because of potential conflicts with the planned use of an area. Such restrictions are usually established at local levels of management and generally apply to applications for mineral leases or sales, although they may affect exploration and development after location through the use of plans of operations. As an example, about 2.7 million acres, or 8% of the Federal lands in Idaho, are being managed by the FS as semi-primitive.

FLPMA (section 204) repeals most earlier withdrawal authorities for specific withdrawals and reservations. The Act reserves authority for some withdrawals and reservations to Congress. It also grants broad authority to the Secretary of the Interior to make withdrawals subject to strict congressional control. The Act gives the Secretary the explicit authority to withdraw land from entry under the General Mining Law of 1872, as amended. Temporary standard and emergency withdrawals are allowed, except that withdrawals for "resource use" may be for whatever period the Secretary deems desirable. In addition, FLPMA (section 204) requires that all pending applications for withdrawal be processed within 15 years or be dropped and that most existing withdrawals in the 11 conterminous Western States be reviewed within 15 years of the Act.

AVAILABILITY OF FEDERAL MINERAL LANDS FOR EXPLORATION AND DEVELOPMENT

Availability of mineral resources on Federal lands has been a concern and a debatable issue for many years. The concerns of Congress and the mineral industry mounted during the 1950's and 1960's over the accessibility of the vast mineral wealth embraced in Federal lands. In response, the Public Land Law Review Commission was established in 1964 to determine whether accessibility to the Nation's mineral wealth was being precluded.

More recently, interest has focused on Federal lands formally (through legal processes) and informally (through management practices) withdrawn from multiple use which precludes the development of minerals. This interest prompted the National Strategic Materials and Minerals Program Advisory Committee (NSMMPAC) and the National Public Land Advisory Council to recommend to the Department of the Interior that withdrawals be inventoried and reviewed. The NSMMPAC suggested that the Secretary of the Interior appoint a high-level Department official to ensure coordination of the effort. The Interagency Land Withdrawal-Inventory Task Force was then established to enhance coordination, avoid the duplication of effort, and utilize the expertise among the agencies involved in the collection of data for this review. For example, the Bureau bases its categories of land

restriction on the **practical effects** (as it interprets them) that actions regarding Federal lands will have on private industry's decision to initiate exploration for and/or development of minerals (see appendix B). Data collected in this manner may have value to other agencies. In addition to collecting data on land restriction for specific purposes, agencies were requested to record information in standard categories as defined by the Interagency Task Force (see appendix C).

The availability of Federal mineral lands in Idaho for location and lease is shown on figure 6, the acreage for each agency and restriction category is shown in table 2, and descriptions of legal and management direction by managing agency is in appendix F. The Bureau's definitions of practical effects for the legal and management categories of restriction are as follows:

Available: Lands where private industry can routinely initiate the development of energy and mineral resources. The land-managing agency practices do not discourage or preclude exploration for and/or development of minerals.

Slightly to moderately restricted: Lands where the practical effects of legal constraints or an agency's practices of management may discourage private industry's initiating exploration for and/or development of minerals.

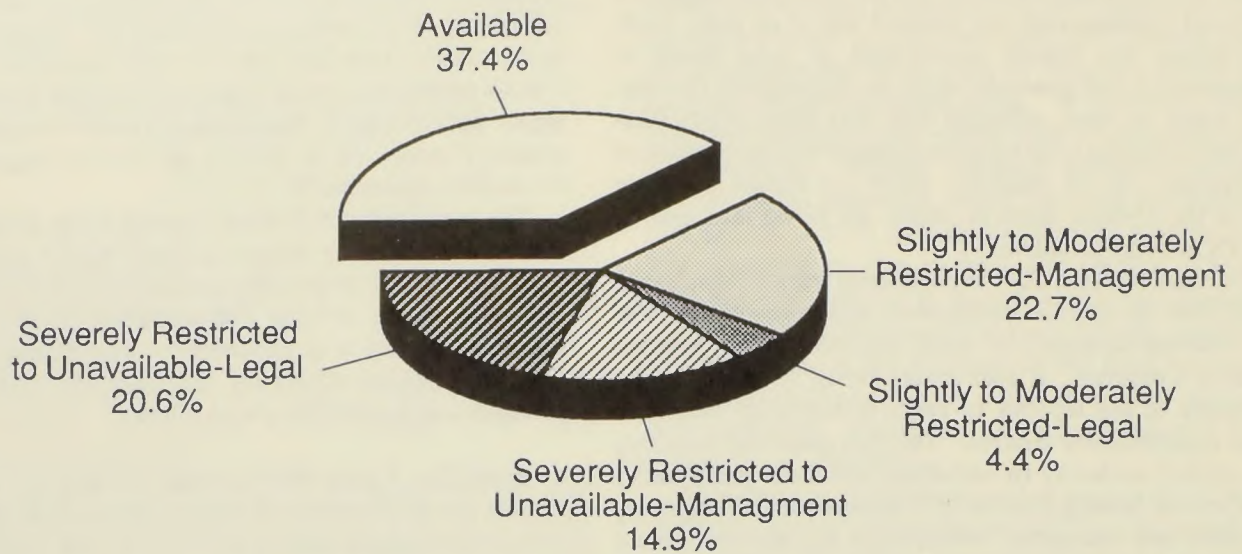
Unavailable or severely restricted: Lands closed to operation under some or all of the mineral laws, or areas where the **practical effects** of legal constraints or practices of management greatly discourage or prohibit private industry's initiating exploration for and/or development of minerals.

ACQUIRED LANDS

Idaho contains 509,441 acres of acquired lands of which 394,000 acres occur on National Forest System (NFS) lands, 78,000 acres on BLM lands, and 37,000 acres on lands managed by the BOR and/or the FWS. The availability of the mineral estate of acquired lands is dependent on statutory authority. Lands acquired under the General Exchange Act of 1922 and the Taylor Grazing Act of 1934 have the status of public lands. Their appropriation under mining and leasing laws, however, depends on appropriate action by the Secretary of the Interior.

The Mineral Leasing Act for Acquired Lands of 1947 provides for disposal of deposits of coal, phosphate, oil, oil shale, gas, sodium, potassium, and sulfur. Locatable minerals in acquired lands may be leased under regulations set forth in Title 43 of the Code of Federal Regulations, part 3500 (43 CFR 3500). They must have been acquired under one of the acts in Section 402 of Reorganization Plan No. 3 of 1946, or the act must expressly mention that the acquired minerals are available for lease.

Locatable Mineral Lands



Leasable Mineral Lands

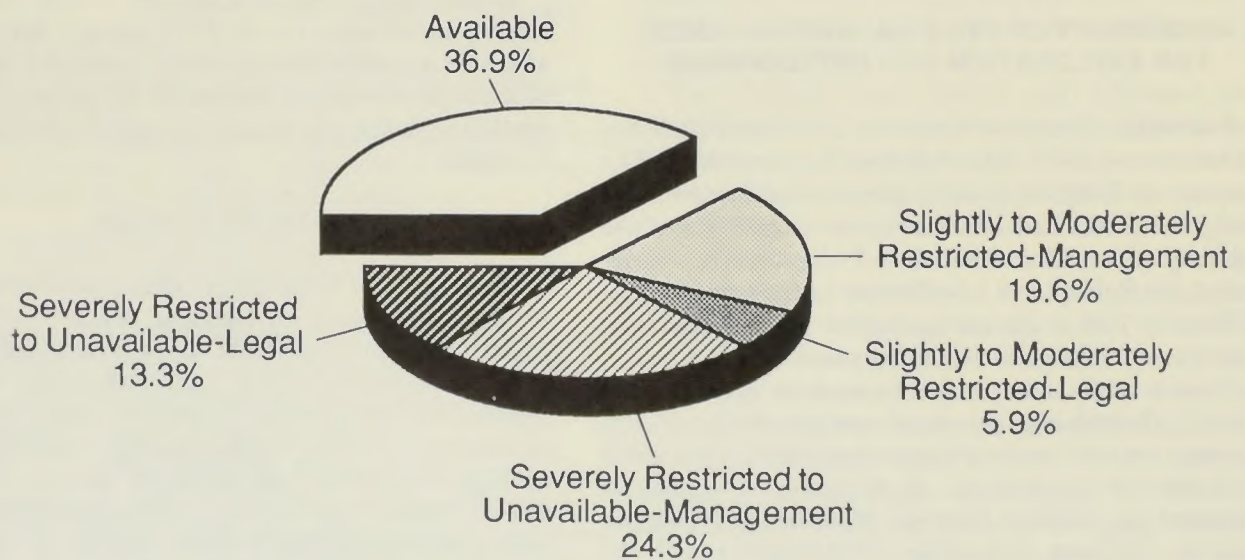


Figure 6.—Locatable and leasable mineral lands in Idaho.

Table 2.—Federal mineral lands by agency and category of restriction¹

(Thousand acres)

Agency	Available	Legal Constraints		Management Practice		Total
		Slightly to moderately restricted	Unavailable to severely restricted	Slightly to moderately restricted	Unavailable to severely restricted	
LOCATABLE MINERAL LAND						
Bureau of Land Management	6,485	1,128	1,795	2,702	1,911	14,021
Fish and Wildlife Service	0	0	41	0	0	41
National Park Service	0	0	91	0	0	91
Bureau of Reclamation	0	0	327	0	0	327
Forest Service	6,538	387	4,166	5,202	3,254	9,547
Sheep Experiment Station	0	0	28	0	0	28
Air Force	0	0	110	0	0	110
Army	0	0	2	0	0	2
Corps of Engineers	0	0	32	0	0	32
Department of Energy	0	0	568	0	0	568
Other ²	0	0	<1	0	0	<1
Total	13,023	1,515	7,160	7,904	5,165	34,767
LEASABLE MINERAL LAND						
Bureau of Land Management	6,471	1,880	338	1,829	3,699	14,217
Fish and Wildlife Service	0	0	0	0	41	41
National Park Service	0	0	91	0	0	91
Bureau of Reclamation	0	0	0	327	0	327
Forest Service	6,699	213	4,314	4,862	4,229	20,317
Sheep Experiment Station	0	0	0	0	28	28
Air Force	0	0	5	0	105	110
Army	0	0	0	0	2	2
Corps of Engineers	0	0	0	0	32	32
Department of Energy	0	0	<1	0	567	568
Other ²	0	0	<1	0	0	<1
Total	13,170	2,093	4,748	7,018	8,703	35,733

¹Bureau in-house tabulation.²Includes Federal Aviation Administration (0.2), Federal Highway Administration (0.02), Immigration and Naturalization Service (0.4), and the Veterans Administration (0.1).

For lands acquired by the BLM or the FS after October 21, 1976, Section 205 of FLPMA (43 U.S.C. 1715) provides that they shall become public lands or NFS lands and that the minerals in such land shall be treated as public minerals. Before these minerals are available for location, a notice of their availability must be published in the Federal Register.

Lands acquired by the DOD or its subordinate agencies are subject to the laws governing public lands, including the mining and leasing laws. Before minerals can be leased on these lands, the managing agency, including any agency with jurisdiction over acquired land, must give its consent.

RECONVEYED LANDS

Idaho contains 79,420 acres of reconveyed lands of which 9,388 acres have the designation of "not open to entry." The FS manages about 2,000 acres in this status and the BLM manages about 7,000 acres. Availability of the mineral estate in reconveyed lands depends on the type and purpose of the conveyance. They are a form of acquired lands, but the type of conveyance must not include acquisition under the previously mentioned laws, acts, or regulations covering acquired lands. For the lands to be open to mining and leasing laws, the Secretary of the Interior or his designated officer must issue an

"open-to-entry" notification to the public through the Federal Register.

MINERAL ESTATE RESERVED TO THE UNITED STATES

Idaho contains 2,286,926 acres of Federal mineral lands which have non-Federal ownership of the surface estate (severed estate). The availability of these lands is considered legally restricted because access must be coordinated with the surface owner. The Federal Government reserved all minerals on 1,318,150 acres, all minerals excluding certain leasable minerals on 2,406 acres, and one or more leasable minerals on 966,370 acres (table 3). Of the mineral estate reserving all minerals, 94,692 acres are on lands administered by the FS, 479 acres are on lands administered by the DOE, 1,203,068 acres are on lands administered by the BLM, and an additional 19,911 acres occur within Indian reservation boundaries but are administered by the BLM. For the 966,370 acres of reserved leasable minerals, 8,327 acres are on land administered by the FS and 958,043 acres are on lands administered by the BLM. Some of the severed estates include more than one of the leasable minerals and acreage figures may include other leasable minerals.

Table 3.—Federal mineral estate and reserved interests

Category	Acreage reserved ¹		Total acres
	Locatable	Leasable	
Surface and all minerals	33,446,406	33,446,406	33,446,406
Non-Federal surface lands:			
All minerals	1,318,150	1,318,150	34,764,556
Certain leasable minerals excluded.	2,406	² 2,406	34,766,962
One or more leasable minerals reserved.	—	966,370	35,733,332
Individual totals:			
Phosphate	—	270,647	35,037,609
Oil and Gas	—	682,057	35,447,613
Coal	—	240,064	35,006,168
Geothermal steam	—	24,265	34,790,227
Potassium and/or sodium	—	1,015	34,767,997

¹To the United States; Bureau in-house tabulations.

²The excluded leasable minerals and acreage are: All minerals except geothermal steam—1,000 acres; all minerals except oil and gas—548 acres; all minerals except oil and gas and coal—858 acres.

AREAS OF PAST MINERAL PRODUCTION AND IDENTIFIED RESOURCES

KMDAs for locatable minerals are shown on plate 1. A list of mines and properties keyed to the numbered KMDAs on this plate are presented in table G-1. A map of mines active in Idaho in 1988 is shown in figure 7. Table 4 lists the mines and the commodities produced.

Each KMDA has been classified as having a high or a medium value, depending on the total value of production and/or identified resources within the area. High-value KMDAs have a total production and/or resource that equals or exceeds \$1 million, based on 1981 commodity prices; medium-value KMDAs have less than \$1 million in total production and/or resource to date. Medium-value KMDAs also include occurrences and geologic terranes known to host deposits similar to those that occur in more productive areas. Mines and prospects within these areas may have produced various mineral commodities or may contain mineral resources that could not be defined with the information available for this study. Areas outside of KMDAs have undetermined value; such areas may contain known but scattered mineral properties as well as

unidentified mineral occurrences and mines with unknown or unrecorded mineral production.

One leasable mineral, phosphate, had enough production and resource information to define high-value KMDAs for plate 2. The medium-value KMDA boundaries follow the mineral classification maps provided by the BLM State Office. Several of the medium-value areas are prospectively valuable for phosphate because of the presence of phosphate-bearing formations. A list of mines, deposits, and prospectively valuable areas are listed in table G-2. Areas with oil, gas, geothermal potential, and known geothermal resource areas (KGRA) were considered important enough to show on plate 2 even though there has been no significant production. Oil and gas potential areas are divided into high and medium potential based on similarities with areas in adjacent States. Geothermal potential areas are divided into high and medium areas based on the temperature of groundwater (above or below 90° C), depth, and the designation as a KGRA.

Table 4.—Mines active in Idaho in 1988

No.	Name	County	Commodities
1.	Bunker Hill ..	Shoshone ..	Zinc, lead, gold.
2.	Coeur .....	.. do.	Silver, copper.
	Galena .....	.. do.	Silver.
	Sunshine .....	.. do.	Silver, antimony, copper.
3.	Lucky		
	Friday .....	.. do.	Silver, lead.
4.	Emerald Creek		
	Garnet	Benewah ...	Industrial garnet.
5.	Yellow Pine-		
	Stibnite	Valley	Gold, antimony, tungsten.
6.	Thunder		
	Mountain ...	.. do.	Gold.
7.	Lost Packer ..	Custer	Do.
8.	Thompson Ck		
	Molybdenum	.. do.	Molybdenum.
9.	Unimin	Gem	Industrial sand.
10.	DeLamar	Owyhee	Silver, gold.
11.	Amcor	Bonneville ..	Pumice.
	Producers		
	Pumice .....	.. do.	Do.
12.	Gay	Bingham ...	Phosphate.
13.	Ash Grove		
	Cement West	Bannock ...	Cement.
14.	Henry	Caribou	Phosphate.
15.	Wooley		
	Valley .....	.. do.	Do.
16.	Lanes		
	Creek .....	.. do.	Do.
17.	Conda .....	.. do.	Do.
18.	Mountain Fuel	.. do.	Do.
19.	Hess	Oneida	Pumice.
	National		
	Perlite .....	.. do.	Perlite.
20.	Northern Stone		
	Supply	Cassia	Dimension stone.

NOTE.—Excludes clays, crushed stone, gem stones, and sand and gravel.

GEOGRAPHIC AND GEOLOGIC SETTING

The following description of the geography of Idaho is from the "Mineral and Water Resources of Idaho" (30), and the description of the geology is from Lowe (16). Idaho contains parts of three distinct physiographic provinces: the Northern Rocky Mountain, the Columbia Intermontane, and the Basin and Range. The State is largely mountainous except in the Snake River Plain where the topography is relatively gentle. The Northern Rocky Mountain Province occurs in the north and central parts of Idaho and consists of an ill-defined, unsystematic



Figure 7.—Mines active in Idaho in 1988.

assemblage of mountains. The southern part of the State contains the east-west arcuate Snake River Plain composed mainly of lit-par-lit basalt flows and river run gravel. The Basin and Range Province occurs in the southeast corner of the State and is represented by broad, elongate valleys between north-trending mountain ranges. Elevations in Idaho range from 710 ft at the confluence of the Snake and Clearwater Rivers to 12,662 ft at Borah Peak. The Snake River Plain ranges from about 2,000 ft on the west side of the State to over 5,000 ft on the east side.

Idaho's geologic history is complex. The oldest rocks in the State are Precambrian and, in northern Idaho, were subjected to the effects of the East Kootenay orogeny.

Regional metamorphism mobilized ore minerals in the Belt rocks to form the rich silver-lead-zinc-copper veins of the Coeur d'Alene district. Cobalt-copper-gold deposits are associated with the Precambrian Yellowjacket Formation. The Paleozoic era is represented by a large assemblage of rock types and contains a variety of mineralization. Fluorspar and lead-silver bearing deposits occur near the contact of the Cambrian Bayhorse Dolomite and the Ordovician Ramshorn Slate. The Permian Phosphoria Formation in southeast Idaho contains phosphate rock deposits. The Permian Dollarhide Formation, in the Black Shale Belt and near the southern extent of the Northern Rocky Mountain Province, contains many lead-silver-zinc deposits of the Wood River district. The Seven Devils group of metamorphosed basalt and andesite flows, of Permo-Triassic age, hosts deformed volcanogenic base metal sulfide deposits. Stockwork molybdenum deposits occur in older Cretaceous granitoids. The Cretaceous Period also produced skarn deposits in roof pendants as a result of plutonism. Tertiary intrusive rocks host deposits of epithermal precious metal, molybdenum, and skarns. The Challis Volcanics of early Cenozoic age overlie arkosic sandstone and conglomerates which contain sedimentary uranium deposits in carbonaceous debris near Stanley, ID. Mineral deposits of antimony, fluorspar, gold, mercury, silver, and tungsten are associated with some cauldron complexes of the Challis Volcanics. The Idavada Volcanics, of mid-Cenozoic age, produced epithermal, hot springs type, gold-silver mineralization associated with rhyolite flows in southwest Idaho. Miocene volcanism in the vicinity of Yellowstone National Park has provided a geothermal resource as indicated by the Island Park Geothermal Area.

MINING HISTORY

The mining history is summarized mainly from Lowe (16), Bureau files, and a Bureau report on industrial minerals (26). Recorded production by year and average annual prices of gold, silver, copper, lead, and zinc are tabulated in appendix H.

The mining industry in Idaho, from 1863 through 1986, has generated more than \$5 billion in newly created wealth from its placers, mines, and quarries. The first authenticated mineral production in Idaho occurred in 1860 after E. D. Pierce and others developed a gold placer that Pierce had discovered. This led to a gold rush and to the formation of the Orofino mining district, the State's first. Placer exploration rapidly expanded to the central and southern parts of the State. The Boise Basin became the most productive placer area, yielding over 2.8 million tr oz of gold. The discovery and development of Idaho's lode deposits quickly followed the placers. Several districts had

been established by 1864. The 1870's were a decade of depression for Idaho's mining. The rich placer deposits were fairly well depleted and lode gold production declined until the price of gold increased in the 1930's.

The focus of mining in the State changed in the 1880's. Argentiferous lead ores in northern Idaho replaced the gold and silver ores of central and southern Idaho as the State's leading ore. The silver-rich lead ores of the Coeur d'Alene mining region were discovered and developed after a short gold rush in the Prichard area in 1883-84. Growth of the Coeur d'Alene region was rapid and spectacular. By 1896, Idaho was the Nation's top lead producer. Phosphate production began about 1906 in southeast Idaho. Lead production peaked in 1917 but remained Idaho's most valuable commodity until the late 1950's, when it was replaced by silver. Idaho became the Nation's leading silver producer in 1933. The price of silver and gold increased dramatically during the 1970's and early 1980's, but silver production and price have since declined steeply. By 1986, several silver mines were forced to suspend their operations and close. Rising silver prices in 1987-88, along with rising zinc prices, allowed some of the mines to reopen. The price of gold remained high resulting in renewed interest in Idaho's gold resources.

Recent mining developments include the discovery of the Thompson Creek molybdenum deposit in 1967 and its initial production in 1983; reopening of the Sunshine Mine and the Bunker Hill Mine in 1988; and the discovery and development of several open-pit, heap-leach, precious-metal mines, including the DeLamar Mine in southwest Idaho. The State also contains large resources of cobalt, thorium, and rare earths.

Of the nonmetallic mineral commodities in Idaho, only sand and gravel, crushed stone, and phosphate, have been produced in large quantities. Sand and gravel, and crushed stone, although important by volume, are not discussed in this report because of their ubiquitous nature. Gem stone production in Idaho includes opal, jasper, petrified wood, aquamarine, quartz, topaz, and garnets of gem and industrial quality. Limestone has been produced in varying quantities and on a generally continuous basis. Asbestos, building stone, pumice, clays, barite, mica, silica, and fluorspar have been produced intermittently. Other commodities, such as coal, kyanite, salt, sulfur, zeolite, and diatomite, have had little historic production. One decorative stone, a thinly layered micaceous quartzite, known as Oakley Stone, has been mined and sold in significant quantities since 1948; the State also contains other significant decorative stone. Idaho contains one of the largest perlite deposits in North America; it has been in production since 1961. Some of the nonmetallic minerals mined in 1988 were phosphate, limestone, clays, perlite, pumice, industrial garnet and industrial sand.

MINERAL PRODUCTION AND IDENTIFIED RESOURCES

Locatable Minerals

Silver

Idaho was the Nation's leading silver-producing State from 1933 to 1986, and total historic production to 1988 exceeds 1 billion tr oz of silver (fig. 8, table H-1). No production or value are shown for 1987 on figure 8 because there were too few silver producers in Idaho to conceal individual mine production. Idaho currently ranks second in the Nation in annual silver production. The State's domestic contribution dropped from 48% in 1985 to 21% in 1987 due to declining world silver prices. The majority of the State's silver has been produced from underground mines in the Coeur d'Alene region of northern Idaho. The veins occur in metamorphosed sediments of the Precambrian Belt Supergroup. Other silver-bearing veins are hosted by Paleozoic rocks in south-central Idaho. Disseminated silver-gold deposits occur in Cenozoic volcanic rocks in the southwest part of the State. Coproducts with silver in most vein deposits are lead, zinc, and copper.

Gold

In 1987, less than 2% of the Nation's gold production came from Idaho. On a statewide basis, however, gold contributed about 15% of the value of Idaho's total non-fuel mineral production. Total recorded production exceeded 8 million tr oz of gold by 1988 (fig. 9, table H-1). No production or values are shown in figure 9 for 1980-1984 because individual mine production could not be concealed. About 3 million tr oz were produced between 1863 and 1873, much of it from placer deposits. Most of the current gold production comes from open pit, heap-leach operations in central and southwest Idaho, although significant deposits are being developed or are in production in other parts of the State.

Base Metals

The copper, lead, and zinc produced in Idaho are dominantly coproducts with silver and are recovered during milling and smelting of silver ores. Mines in the Coeur d'Alene mining region are the primary source of Idaho's base metals. Total recorded production of these metals, as of 1988, is 0.3 million st of copper, 8 million st of lead, and 3 million st of zinc. Table H-1 contains production data, by year, for these metals. Figure 10 shows the production for lead and zinc by year. However, declining silver prices and production over the last 10 years have

adversely affected Idaho's base metal output. Production and values are withheld for certain years because individual mine production could not be concealed.

Molybdenum

Idaho was the Nation's third largest producer of molybdenum in 1987. Principal production came from the Thompson Creek Mine where the molybdenum occurs in the Thompson Creek granodiorite and quartz-monzonite stock.

Antimony

Idaho's Antimony Rainbow Mine was the Nation's only producer of antimony in 1987. The Sunshine Mine, normally the top domestic producer of antimony as a by-product of silver production, was idle for the entire year (22).

Other Locatable Minerals

Other recorded metal production included cadmium, cobalt, manganese, mercury, nickel, niobium and tantalum, tungsten, and vanadium. Some of these metals are by-products of silver or gold ores. Large resources of cobalt occur in the Blackbird mining district, but metallurgical difficulties have made past mining ventures unprofitable without subsidized prices. Idaho is the primary domestic producer of vanadium which is recovered from ferrophosphorus slag generated during the production of elemental phosphorus. Tungsten from Idaho has accounted for almost 10% of the Nation's total historic production (30).

Locatable nonmetallic and industrial minerals with recorded production include barite, diatomite, fluorspar, garnet, gem stones, gypsum, mica, perlite, salt, silica, rare earths, titanium minerals, and uncommon varieties of clays, stone, and pumice. Industrial grade garnet production began in the early 1940's and, since the 1970's, Idaho has ranked first in domestic production of this commodity. Idaho was the Nation's fourth largest producer of pumice in 1987 (22).

Leasable Minerals

Phosphate

The State currently ranks third in the Nation in the production of phosphate rock (22). The first record of production was in 1906 from the Western Phosphate Field in southeastern Idaho. This area is divided into 10 districts. The most important, based on past production are the Trail Creek, Blackfoot River, Fort Hall, and Crow Creek districts (25).

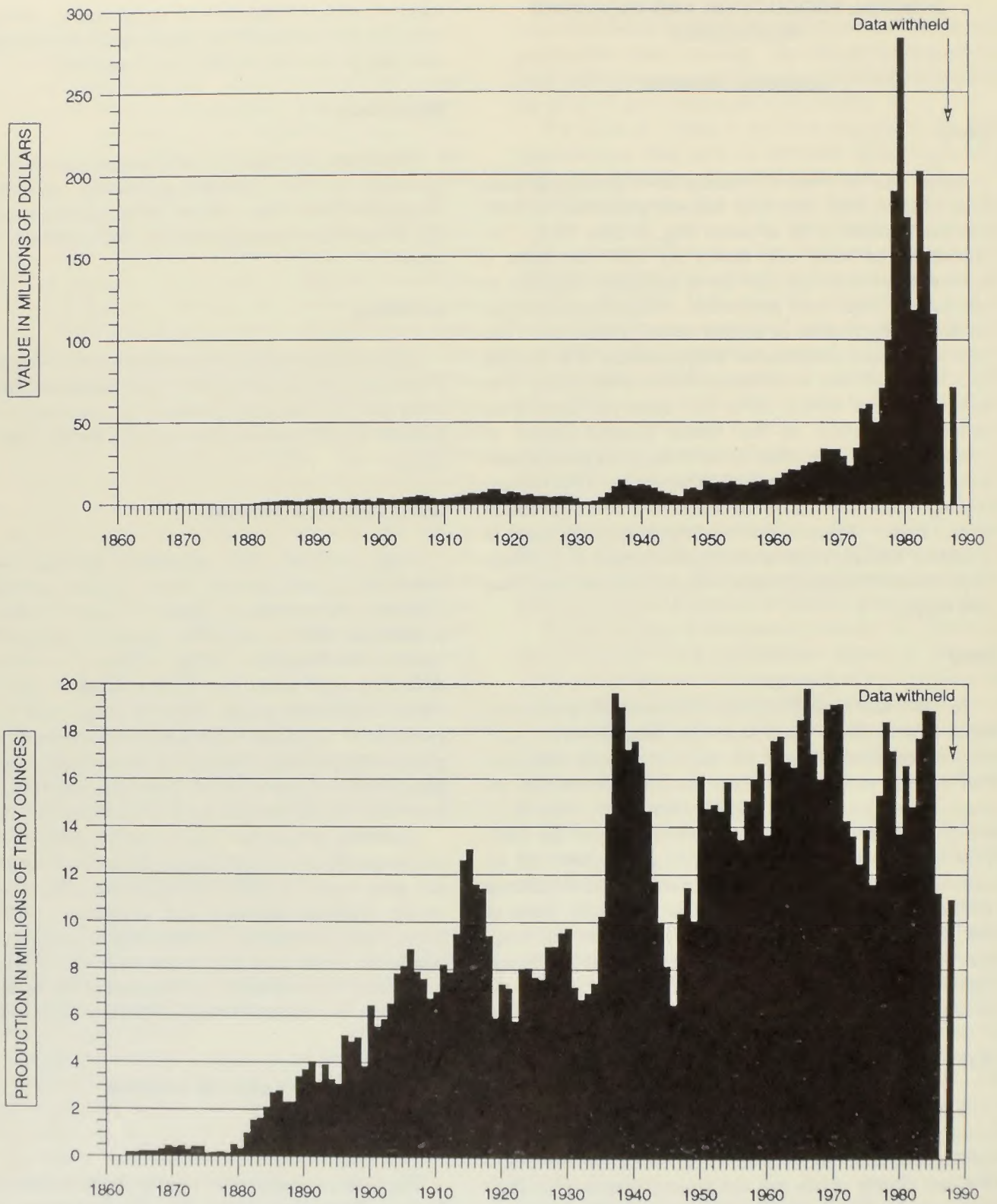


Figure 8.—Silver value and production in Idaho, 1863-1988.

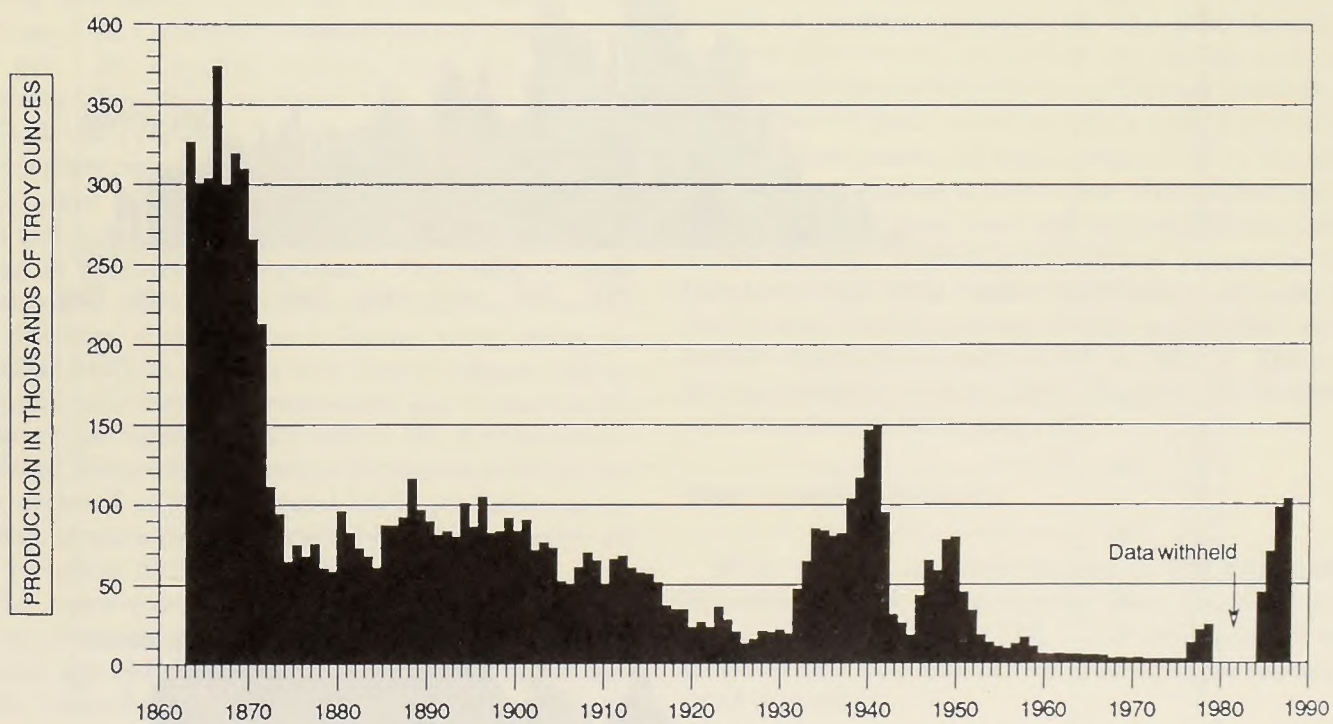
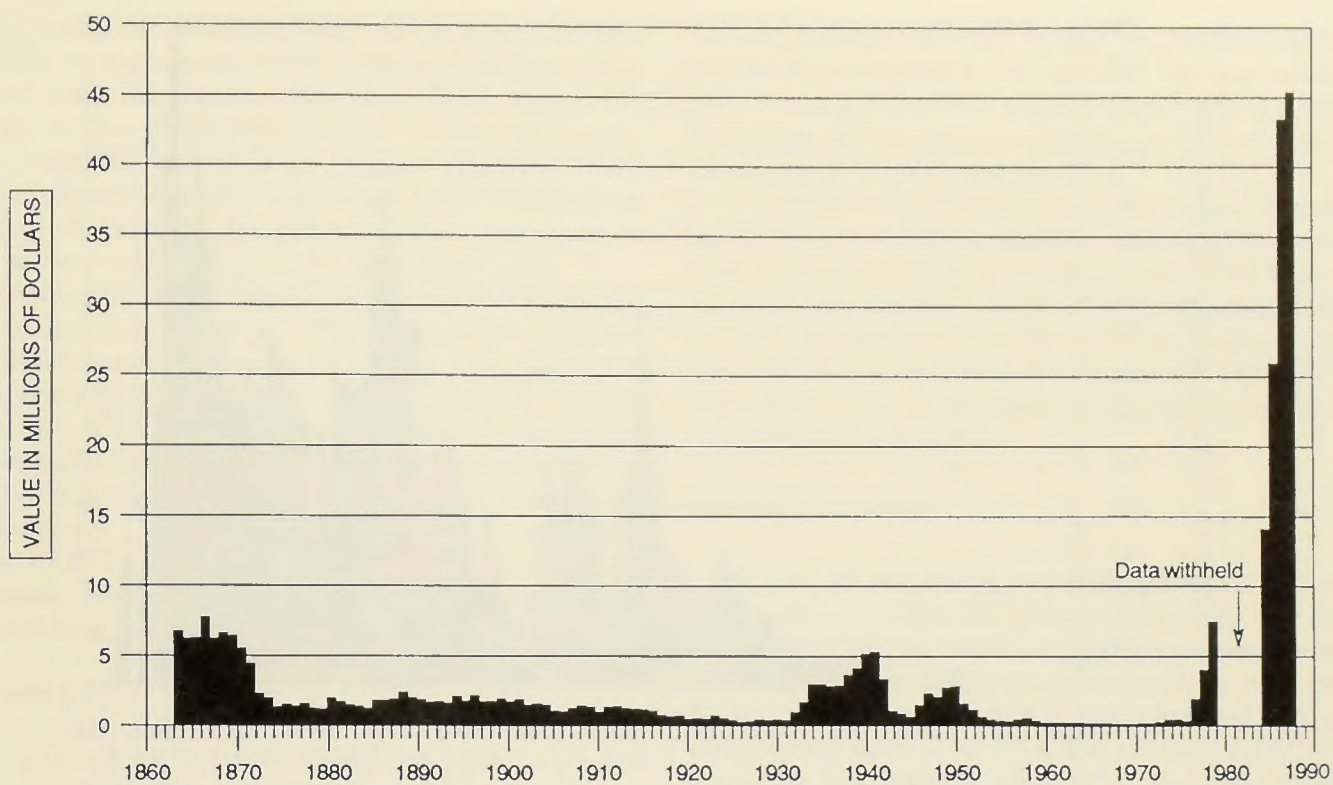


Figure 9.—Gold value and production in Idaho, 1863-1988.

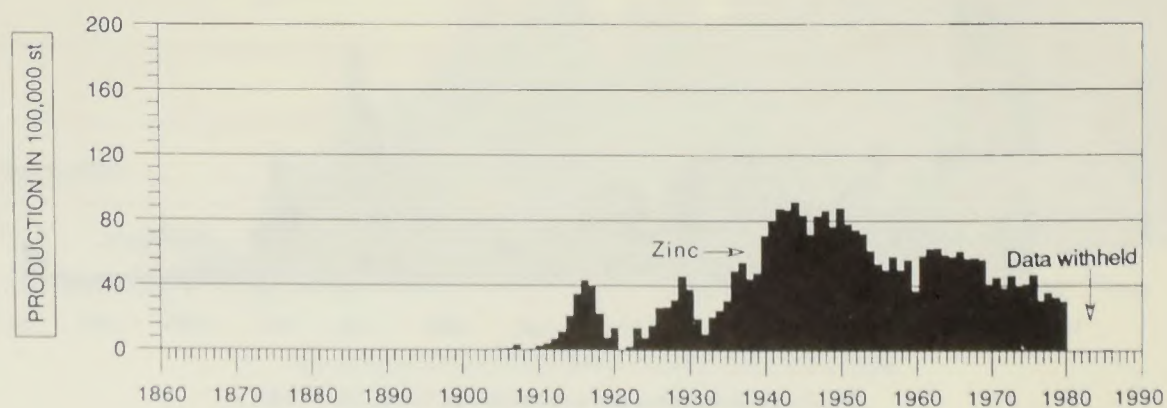
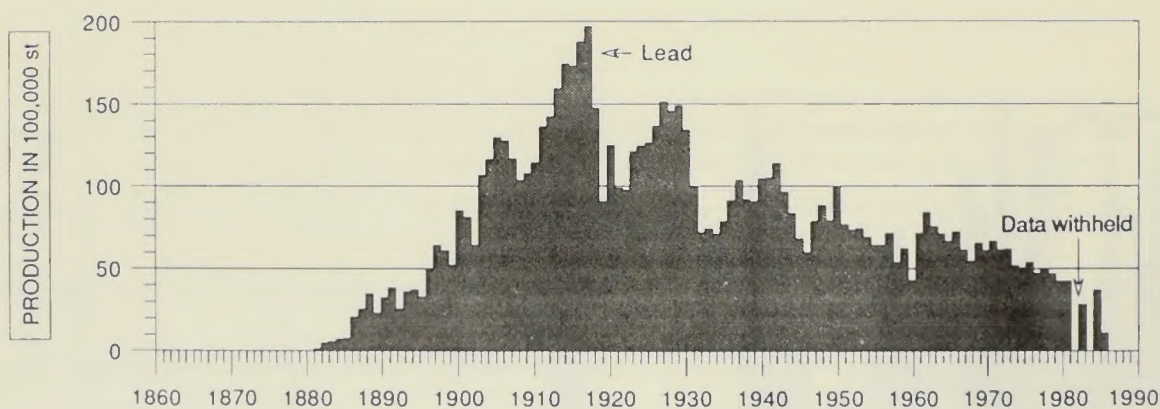
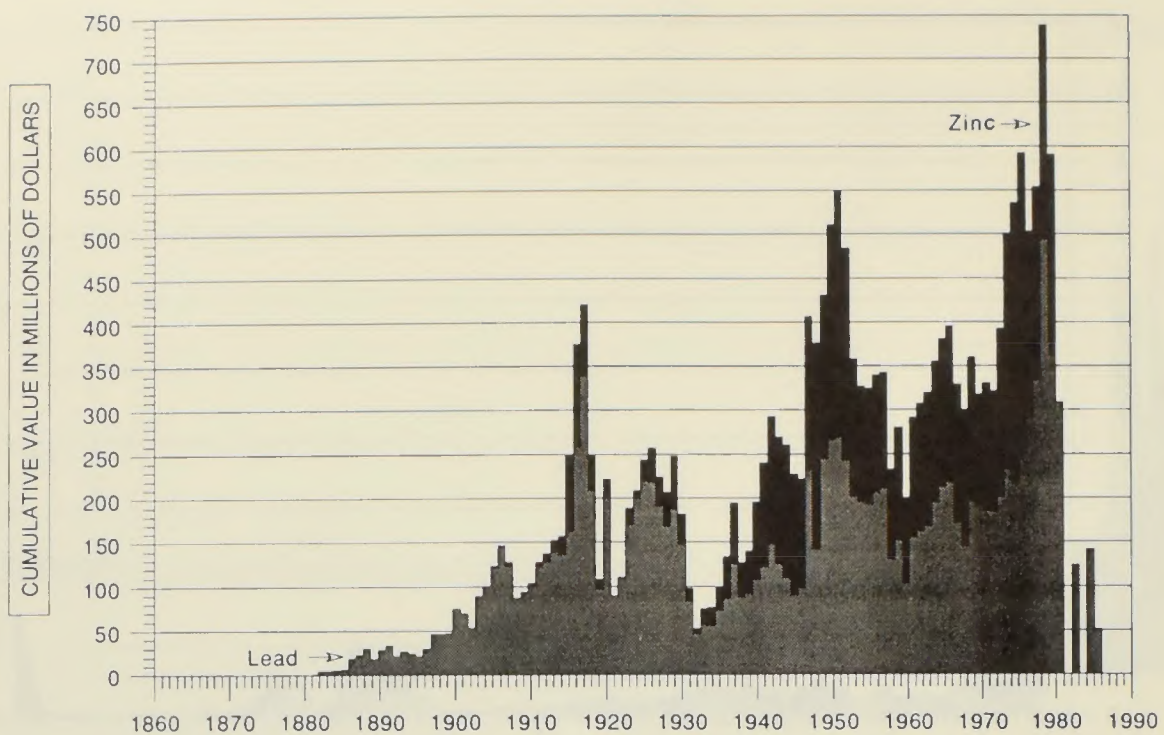


Figure 10.—Lead and zinc value and production in Idaho, 1863-1988.

Currently, six phosphate mines are in operation; they account for approximately 83% of the total phosphate produced from the Western Phosphate Field (Bureau of Mines records, 1987). Southeastern Idaho possesses the most extensive reserves in the Western Phosphate Field, which also extends into Wyoming and Utah. Commercial grade rock members are generally thicker and closer to the surface in Idaho than in the other States (11).

Deposits currently being mined occur in the Phosphoria Formation of Permian age. These strata were originally deposited as mud on the sea bottom, but have since been extensively folded, faulted, and uplifted. They are exposed in narrow strips along the flanks of ridges and mountains where surface mining can be performed. Where the strata are not well exposed at the surface, underground mining is necessary (11). The boundaries of the moderate-value KMDAs on plate 2 represent the extent of known phosphate-bearing formations and are from the mineral classification maps of the BLM.

Oil and Gas

The Overthrust belt of Wyoming-Utah-Idaho forms part of a single tectonic element, termed the Cordilleran orogenic belt, that extends from northern Alaska to Central America. Linear assemblages of very thick sedimentary rocks, which have undergone intensive thrust faulting and folding, typify the Overthrust belt. Two portions of the Cordilleran orogenic belt are producing oil and gas: the Canadian foothills thrust belt and the Wyoming-Utah-Idaho Overthrust belt.

The broadly explored Canadian foothills thrust belt and the relatively unexplored Wyoming-Utah-Idaho thrust belt share many characteristics including general structural form and tectonic activity, reservoirs, depth of burial, and timing of hydrocarbon migration. They differ in their major source rocks and paleothermal histories. Since the first discovery of oil and gas in Turner Valley within the Canadian foothills, 32 fields have been developed, and an estimated 9.3 trillion ft³ of recoverable gas, 143 million bbl of natural gas liquids, and 132 million bbl of oil have been produced. Since 1975, significant discoveries of oil and gas have occurred in Wyoming and Utah; production is estimated at more than 500 million bbl of recoverable oil and 5.5 trillion ft³ of recoverable gas (14).

The major source rocks in Wyoming and Utah occurring in Idaho include the Phosphoria Formation of Permian age and the Thaynes Formation of Triassic age. These formations have thermal histories conducive to

movement of hydrocarbons. In addition, possible reservoir areas in close association with potential Triassic, Permian, and Mississippian source rocks may occur in the Wells Formation of Pennsylvanian age, and the Mission Canyon Limestone of Mississippian age (24).

No commercial production has been reported to date for oil and gas resources in Idaho. Areas of high or moderate potential on plate 2 are formations which have exhibited oil and gas resources in neighboring States. Public law 100-203 closed all WSAs to oil and gas leasing in 1987. Much of the mineral estate that is severely restricted by management are WSAs; a map of just oil and gas status would be similar to plate 1.

Geothermal Water

At least 380 hot springs and wells are known to occur in the central and southern parts of Idaho (31). The thermal waters flow from rocks ranging in age from Precambrian to Holocene and from a wide range of rock types. Measured water temperatures at 124 inventoried wells and springs range from 12° to 93° C and averaged 50° C. Surface water temperatures above 90° C were measured at two wells within the Raft River (Frazier) KGRA in the Raft River Valley (31).

Several areas identified as having high geothermal resource potential (greater than 90° C) are: the Yellowstone KGRA in northeastern Idaho, the Raft River KGRA in the Raft River Valley, the Weiser Hot Springs area, and the Bruneau-Grandview Area on the western Snake River Plain. None of these areas have any recorded production of geothermal steam. However, water at 77° C has been used for space heating in Boise since 1892. A demonstration project also heats State and Federal buildings within the city (10). According to Cuff and Young (10, 30), Idaho rates first in the Nation in geothermal potential for heat in-place and geothermal energy in identified intermediate hydrothermal systems (90° to 150° C). The geothermal potential areas on plate 2 are from the Geothermal Resources of Idaho map (20).

Other Leasable Minerals

Idaho contains scattered deposits of coal and lignite. Estimates of total coal production from the Horseshoe Creek district is 100,000 st (30). Coal and lignite are not shown on plate 2 because neither production nor resources could be verified.

SPATIAL RELATIONSHIP OF FEDERAL MINERAL AVAILABILITY WITH KNOWN MINERAL DEPOSIT AREAS

The results of the spatial comparison of KMDAs and areas of potential with Federal mineral lands and with the status or availability of the lands for exploration and development of its mineral resources are shown in tables 5 and 6. Areas of past mineral production and/or known mineral resources identified as medium- and high-value for selected locatable minerals total 8.6 million acres, or about 16% of Idaho. Of these, 6.7 million acres (78%) are Federal mineral lands (table 5).

Table 6 shows, for example, that of the 6.4 million acres of high-value Federal mineral lands potentially accessible to location of mining claims, 36% is severely restricted or unavailable (22% from legal actions and about 14% as a result of management actions). Likewise, of the 325,000 acres of medium value, 50% are unavailable or severely restricted (45% from legal actions and 5% from management actions).

**Table 5.—Summary of known mineral deposit areas compared
with Federal mineral lands in Idaho**

Category	Total State area (thousand acres)	Federal mineral lands	Percent of Total
SELECTED LOCATABLE MINERAL RESOURCES			
High value	8,125	6,400	79
Medium value	488	325	67
Unknown-unranked	44,491	28,042	63
Total	53,104	34,767	65
PHOSPHATE			
High value	441	351	80
Medium value	2,211	1,425	64
Unknown-unranked	50,452	33,262	66
Total	53,104	35,038	66
OIL AND GAS			
High potential	1,964	1,384	70
Moderate potential	7,820	3,969	51
Unknown-unranked	43,320	30,095	69
Total	53,104	35,448	67
GEOHERMAL WATER			
KGRAs >90°C (high potential) . .	1,208	818	68
<90° C (moderate potential) . . .	7,172	3,076	43
Unknown-unranked	44,724	30,896	69
Total	53,104	34,790	65

Table 6.—Comparison of Federal mineral availability and known mineral deposit areas (KMDAs)

(thousand acres)

LOCATABLE MINERALS

KMDAs (value)

Availability category	High		Medium		Remainder of State		Total Federal minerals	
	acres	%	acres	%	acres	%	acres	%
Available	2,322	36.3	99	30.5	10,602	37.8	13,023	37.4
Slightly to moderately restricted:								
Legal	201	3.1	17	5.2	1,297	4.6	1,515	4.4
Management	1,570	24.5	47	14.5	6,287	22.5	7,904	22.7
Subtotal	1,771	27.6	64	19.7	7,584	27.1	9,419	27.1
Severely restricted to unavailable:								
Legal	1,427	22.3	146	44.9	5,587	19.9	7,160	20.6
Management	880	13.8	16	4.9	4,269	15.2	5,165	14.9
Subtotal	2,307	36.1	162	49.8	9,856	35.1	12,325	35.5
Total	6,400	100.0	325	100.0	28,042	100.0	34,767	100.0

LEASABLE MINERALS

Phosphate

Potential

Availability category	High		Moderate		Remainder of State		Total Federal minerals	
	acres	%	acres	%	acres	%	acres	%
Available	130	37.0	396	27.8	12,421	37.3	12,947	36.9
Slightly to moderately restricted:								
Legal	61	17.4	343	24.1	1,667	5.0	2,071	5.9
Management	91	25.9	314	22.0	6,302	19.0	6,707	19.2
Subtotal	152	43.3	657	46.1	7,969	24.0	8,778	25.1
Severely restricted to unavailable:								
Legal	3	.9	47	3.3	4,682	14.1	4,732	13.5
Management	66	18.8	325	22.8	8,190	24.6	8,581	24.5
Subtotal	69	19.7	372	26.1	12,872	38.7	13,313	38.0
Total	331	100.0	1,425	100.0	33,262	100.0	35,038	100.0

Table 6.—Comparison of Federal mineral availability and known mineral deposit areas (KMDAs)—Continued

(thousand acres)

Oil and Gas								
Availability category	Potential		Potential		Remainder of State		Total Federal minerals	
	High		Moderate					
	acres	%	acres	%	acres	%	acres	%
Available	453	32.7	1,592	40.1	11,056	36.7	13,101	37.0
Slightly to moderately restricted:								
Legal	112	8.1	529	13.3	1,452	4.8	2,093	5.9
Management	474	34.2	716	18.0	5,586	18.6	6,776	19.1
Subtotal	586	42.3	1,245	31.4	7,039	23.4	8,870	25.0
Severely restricted to unavailable:								
Legal	27	2.0	190	4.8	4,567	15.2	4,784	13.5
Management	318	23.0	942	23.7	7,434	24.7	8,694	24.5
Subtotal	345	25.0	1,132	28.5	12,001	39.9	13,478	38.0
Total	1,384	100.0	3,969	100.0	30,095	100.0	35,448	100.0

Geothermal								
Availability category	Potential		Potential		Remainder of State		Total Federal minerals	
	High		Moderate					
	acres	%	acres	%	acres	%	acres	%
Available	223	27.3	1,431	46.5	11,212	36.3	12,866	37.0
Slightly to moderately restricted:								
Legal	84	10.3	375	12.2	1,600	5.2	2,059	5.9
Management	208	25.4	512	16.6	5,952	19.2	6,672	19.2
Subtotal	292	35.7	887	28.8	7,552	24.4	8,731	25.1
Severely restricted to unavailable:								
Legal	39	4.8	236	7.7	4,431	14.3	4,706	13.5
Management	264	32.2	522	17.0	7,701	24.9	8,487	24.4
Subtotal	303	37.0	758	24.7	12,132	39.3	13,193	37.9
Total	818	100.0	3,076	100.0	30,896	100.0	34,790	100.0

SUMMARY

Approximately 35.7 million acres (67%) of Idaho's 53.1 million acres are Federal mineral lands. Between 21 and 23 million acres, or about 60% of these lands, have some type of restriction or prohibition affecting mineral resource development. Many of the restrictions are legal withdrawals, such as congressionally designated wilderness, national parks, recreation areas and monuments, military reservations and weapons test sites, wildlife refuges, the

Idaho National Engineering Laboratory, and similar areas dedicated to specific uses. Other common legal withdrawals include administrative and communication sites, archeological and historical locales, Areas of Critical Environmental Concern (ACECs), and reclamation and power projects. The BLM is currently reviewing the justifications for many of these withdrawals as required by FLPMA.

Land management policies and practices also affect mineral resource development. Much of the management direction is toward protection of critical habitat for game and protected species. Wildlife resource management can affect exploration activities by placing seasonal restrictions on operations and sometimes requiring lengthy site inspections and costly mitigating measures. A major factor affecting the direction of management is the Wilderness Act of 1964, which requires agencies to protect wilderness values of Federal lands until Congress determines they are suitable for inclusion in the NWPS; about 3 million acres of land in Idaho are awaiting this determination. Generally, lands found to be unsuitable for wilderness will be returned to multiple-use management. An additional 2.7 million acres are presently being managed as semi-primitive. Idaho currently has about 3.7 million acres legally classified as wilderness.

In the State of Idaho, 79% of the high-value locatable mineral lands and 67% of the medium-value lands are Federal. Currently, 36% of these high-value lands and 30% of the medium-value lands remain available; 28% and 20%, respectively, are restricted; and 36% and 50%, respectively, are severely restricted or unavailable. The Federal Government also holds title to 63% of the remaining lands which do not have identified KMDAs.

For phosphate, 80% of the high-value mineral lands and 64% of the medium-value lands are Federal. Currently, 37% of the high-value lands and 28% of the medium-value lands remain available; 43% and 46%, respectively, are restricted; and 20% and 26%, respectively, are severely restricted or unavailable. Federal ownership of the unknown and unranked category for phosphate amounts to 66%.

At present, Federal mineral lands in Idaho contain 70% of the high-potential acreage for oil and gas. Similarly, 51% of the moderate-potential lands are under Federal ownership and management. About 33% of the lands with high potential and 40% with moderate potential are available. Presently, 42% of the high potential and 31% of the moderate potential Federal mineral lands are restricted. About 25% of the high-potential area and 29% of the moderate-potential areas are severely restricted or unavailable. About 69% of the unranked or unknown lands for oil and gas are federally owned.

The Federal mineral estate in Idaho contains 68% of the high-potential and 43% of the moderate-potential acreage for geothermal steam. About 27% of the high potential and 46% of the moderate potential lands are available. About 36% of the high-potential and 29% of the moderate-potential lands are restricted. The remaining 37% of the high-potential acreage and 25% of the moderate-potential acreage for geothermal resources are severely restricted or unavailable. Approximately 69% of Idaho's lands in the unranked or unknown category for geothermal steam are in Federal ownership.

The KMDAs identified through this study represent the loci of past and present mineral exploration and development in Idaho's history; they are not limits of mineral potential but are areas of proven substantial value. Viable prospects and operating properties also occur outside KMDAs. Such properties represent the identification of new KMDAs or the expansion of known KMDAs, and increase our domestic sources of minerals.

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APPENDIX A.—GLOSSARY

Acquired lands—Lands in Federal ownership that were obtained by the Government through purchase, condemnation, or gift, or by exchange for such purchased, condemned, or donated lands, or for timber on such land. Federal lands that are not public domain lands.

Area of critical environmental concern (ACEC)—An area where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

Cadastral survey—The official Government survey of public lands, now a function of the Bureau of Land Management. Such surveys establish land boundaries by the use of monuments and provide descriptions of surveyed lands by means of field notes and plats.

Classification—The designation of lands as being valuable or suitable for specific purposes, uses, or resources. (See segregation).

Competitive lease—A mineral lease covering specified public lands within a known producing area or geologic structure, issued to a successful bidder at public auction or through sealed bids.

Critical and strategic mineral—A mineral commodity that is essential for a strong national economy and defense but is not produced in the United States in sufficient quantity to meet such needs.

Critical habitat—Habitat that is essential for the survival of a threatened or endangered species. Designated and protected pursuant to the Endangered Species Act of 1973, as amended.

Critical range—Range on which a species depends for survival; there are no alternative ranges available because of climatic conditions or other limiting factors. May also be called key range or crucial range.

De facto withdrawal—Closure of Federal lands to mining and/or mineral leasing, or restrictions on such activities by methods other than formal withdrawal. Includes segregating applications, notices of realty actions, lands acquired or purchased but not opened, and Bureau of Land Management land classifications. One category of management restriction.

Federal lands—All lands where title to the surface estate is held by the Federal Government, with or without corresponding title to any or all of the minerals. Excluded are lands held by the United States in trust for Indians, Aleuts, or Eskimos.

Federal mineral lands (Federal minerals)—That portion of the mineral estate owned by the Federal Government.

Known geologic structure (KGS)—A trap in which an accumulation of oil or gas has been discovered by drilling and which is determined to be productive, the limits of which include all acreage that is presumptively productive. If lands are included within a KGS, they may be leased only through a competitive system.

Known geothermal resource area (KGRA)—A known geothermal resource area is defined in 43 CFR 3200.0-5(K) as "an area in which the geology, nearby discoveries, competitive interests, or other indicia would, in the opinion of the Secretary, engender a belief in men who are experienced in the subject matter that the prospects for extraction of geothermal steam or associated geothermal resources are good enough to warrant expenditures of money for that purpose." Federal lands within a KGRA, may be leased only through a competitive bidding system.

Leasable minerals—Oil and gas, oil shale, coal, potash, phosphate, sodium, sulfur in Louisiana and New Mexico, silica deposits in certain parts of Nevada, and certain minerals under special acts, e.g., the Acquired Lands Act. Minerals that may be obtained under the Mineral Leasing Act of 1920, as amended.

Lease—A Federal lease, issued under provisions of the mineral leasing laws, which grants an exclusive right to explore for and extract the mineral leased.

Legal restriction—Closure of Federal lands to mining and/or mineral leasing, or restraints on mineral exploration and development, by statute (law), executive, secretarial, public land order, or other formal method.

Locatable minerals—Whatever are recognized as minerals by the standard authorities, whether metallic or other substance, when found in public lands in quantity and quality sufficient to render the lands valuable on account thereof. Minerals that may be obtained under the General Mining Law of 1972, as amended. Excludes minerals specifically designated as leasable or salable minerals.

Management restriction—Closure of Federal lands to mining and/or mineral leasing, or restraints on mineral exploration and development, by agency policy, management decision, regulation, or other discretionary method.

Master title plat (MTP)—A diagrammatic map, usually of an entire township of the public land survey, showing land status. Collectively, the official land status records of the Bureau of Land Management.

Mineral—Inorganic and certain organic substances occurring naturally, with characteristics and economic uses that bring them within the purview of mineral laws; a substance that may be obtained under applicable laws from Federal lands by purchase, lease, or mining claim.

Mineral deposit—A mass of naturally occurring minerals that may or may not have economic value.

Mineral estate—Ownership of minerals, or subsurface estate, as distinct from ownership of the surface. May be joined or separate from surface ownership. If separate, rights of access for exploration, development, and other uses of the surface incidental to mining are usually reserved as well.

Mineral exploration and development—The sequence of activities that includes search for and acquisition of mineral deposits, the study and work necessary to determine if such deposits are feasible to mine, and the preparation, if warranted, of a deposit for production (extraction). These activities generally will not be undertaken by private companies or by individuals without a reasonable expectation that they can produce at a profit any valuable deposit that might be discovered.

Mineral materials—Minerals such as common varieties of sand, stone, gravel, cinders, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be obtained under the Materials Act of 1947, as amended. These are the salable minerals.

Mining district—Originally indicating a local government entity established by the miners, the term is now used to designate a geographic area where related metalliferous (usually) mineral deposits occur.

Multiple use—The management of public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

Outstanding natural area—Area of outstanding scenic splendor, natural wonder, or scientific importance that merits special attention and care in management to ensure its preservation in its natural condition.

Permissible—A category of favorability applied to geographic regions not presently productive of oil and gas, where sedimentary rocks that are capable of holding oil or gas deposits are known or believed to exist.

Primitive area—Extensive natural, wild, and undeveloped area or setting essentially removed from the effects of civilization.

Prospecting permit—A permit that authorizes prospecting for deposits of specified leasable minerals on Federal lands not known to contain such deposits.

Public domain lands—Vacant, unappropriated, and unreserved lands that have never left Federal ownership; also lands in Federal ownership that were obtained by the Government in exchange for public domain lands or for the timber on public domain lands. One category of Federal lands. (Compare with acquired lands.)

Public lands—Any lands and interest in lands owned by the United States within the several States and

administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except (1) lands located on the Outer Continental Shelf and (2) lands held for the benefit of Indians, Aleuts, and Eskimos. Includes public domain and acquired lands.

Reconveyed lands—A form of acquired lands in which the Federal Government has received privately owned lands for public domain land, generally under the General Exchange Act of 1922, the Revested Oregon and California Railroad and Reconveyed Coos Bay Wagon Road Grant (O. & C.) Lands Act of 1916, or Section 8 of the Taylor Grazing Act of 1934 repealed by section 705(a) of FLPMA. These lands are considered public domain lands. Such lands may be subject to appropriation under the mining and mineral leasing laws providing they are formally opened by the Secretary of the Interior.

Regulations—Administrative rules or statements, which after due notice, have the force and effect of law. Used by State and Federal agencies to implement and ensure uniform application of statutory law.

Research natural area—An area that is established and maintained for the primary purpose of research and education. It is a biological unit where present natural conditions are maintained. These conditions are achieved by allowing natural biological processes to prevail without human intervention.

Reservation—A withdrawal usually of a permanent nature; also any Federal lands that have been dedicated to a specific public purpose. (See segregation).

Reserved lands—Federal lands that are dedicated or set aside for a specific public purpose or program and that are, therefore, generally not subject to disposition under the operation of all or some of the public land laws.

Restoration—An action concurrent with or following a revocation, which effects the opening to disposition of public lands in a withdrawal; also, in respect to ceded Indian lands, an action that returns lands to tribal ownership.

Restrictions—Restraints of all types on mineral exploration and development on Federal lands. In this study, restrictions are classed as legal or management, depending upon the authority or method by which they are effected. All degrees of restraint are included, ranging from normal regulations and standard stipulations to closure of Federal lands to mining and/or mineral leasing.

Revocation—Generally, an action that cancels a previous official act; specifically, an action that cancels a withdrawal.

Salable minerals—Minerals such as common varieties of sand, stone, gravel, cinders, pumice, pumicite, and clay that may be obtained under the Materials Act of 1947, as amended.

School lands—Federal lands given to various States for the support of public education.

Section—One of the 36 numbered subdivisions, each 1 mile square, of a township. A normal section contains 640 acres but may be larger or smaller to compensate for surveying errors or adjustments.

Segregation—Any action, such as withdrawal, that suspends the operation of all or some of the public land laws, including the mining and mineral leasing laws. A mineral segregation occurs when such an action suspends the operation of the mining or mineral leasing laws for particular Federal lands. Three distinct methods of segregation are classification, withdrawal, and reservation.

Severed estate—Any parcel of land with separate owners of the surface and mineral estates resulting from mineral reservations in title transfers. Different minerals, or portions of the mineral estate, may be owned separately in the same manner.

Special recreation management area—Areas requiring explicit recreation management to achieve the recreation objectives and to provide specific recreation opportunities. Such areas are identified in the resource management objectives for the area. Major recreation investments are concentrated in these areas.

Stipulation—Limiting term or condition in a mineral lease that requires the lessee to meet a specified standard or to follow certain procedures, usually for the protection of other resource values.

Surface estate—Ownership of land exclusive of minerals rights. (See severed estate).

Sustained yield—The achievement and maintenance in perpetuity of a high level of annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use.

Township—The major subdivision of surveyed, or protracted, public lands. Ideally, each township is 6 miles square and contains 36 sections each 1 mile square of 640 acres in size.

Wilderness area—An area of undeveloped Federal land retaining its primeval character and influence without permanent improvement or human habitation, which is protected and managed to preserve its natural conditions. Includes designated wilderness areas in the National Wilderness Preservation System (NWPS).

Wilderness study area (WSA)—An area designated by a Federal agency or Congress for consideration to be added to the NWPS. The area is managed to preserve wilderness characteristics until it is determined if it should or should not be added to the NWPS. Includes further planning areas and instant study areas.

Withdrawal—A formal action withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; also, lands that have been dedicated to public purposes (See segregation).

APPENDIX B.—GUIDELINES FOR MINERAL USE RESTRAINT CATEGORIES ON FEDERAL LANDS, PREPARED BY THE BUREAU OF MINES

Table B-1.—Mineral use restraint guidelines

Holding agency and type of land	Available	Mod/Slight restricted		Unavail/severe restricted	
		Legal	Mgt	Legal	Mgt
Department of Agriculture:					
Agricultural Research Service					
Administrative site				Lo	Le
Experimental range				Lo	Le
Quarantine station				Lo	Le
Forest Service:					
Administrative site				Lo	Le
Big-game winter habitat			Lo,Le		
Campground				Lo	Le
Experimental forest				Lo	Le
Land utilization project	Lo,Le				
National forest	Lo,Le				
National grassland	Lo,Le				
National recreation area				Lo,Le	
No lease or no surface occupancy			Lo		Le
Picnic area				Lo	Le
Ranger station				Lo	Le
Recreation site				Lo	Le
Research natural area				Lo	Le
Roadside zone				Lo	Le
Seasonal no surface occupancy			Lo,Le		
Water supply or watershed					Lo,Le
Wild and scenic river (proposed)					
				Lo,Le	
Wild and scenic river (designated)				Lo,Le	
				Lo,Le	
Wilderness area					Lo,Le
Wilderness study area					Lo,Le
Winter sports area					Lo,Le
Department of Defense:					
Air Force:					
Military reserve				Lo,Le	
Army:					
Military reserve				Lo	Lo,Le
Corps of Engineers:					
Civil works project					Lo,Le
Department of the Navy:					
Military reserve					Lo,Le
Bombing range					Lo,Le
Department of Energy:					
Atomic Energy withdrawal				Lo,Le	
Federal Energy Regulatory Comm.					
Federal power withdrawal				Lo	Le
Power site classification		Lo,Le			
Power site reserve		Lo,Le			
Department of the Interior:					
Bureau of Land Management:					
Acquired land ¹	Le	Lo			
Archeological and historic sites			Le	Lo	Le
Area of critical environmental concern (ACEC)				Lo,Le	
Classification and multiple Use Act classification	Le			Lo	
No lease or no surface occupancy					Le
Notice of realty action				Lo	
Off road vehicle (ORV)					Lo,Le

Table B-1.—Mineral use restraint guidelines—Continued

Holding agency and type of land	Available	Mod/Slight restricted		Unavail/severe restricted	
		Legal	Mgt	Legal	Mgt
Department of the Interior—Continued:					
Bureau of Land Management:					
Outstanding natural area				Lo	Le
Protective withdrawal				Lo	Le
Public domain land, vacant	Lo,Le				
Public sale application				Lo,Le	
Public water reserve				Lo ²	
Recreation and public purpose classification				Lo,Le	
Research natural area				Lo	Le
Seasonal no surface occupancy			Le		
Segregating applications				Lo,Le	
Small tract			Le	Lo	
Special recreation management area			Lo,Le		
Stock driveway withdrawals	Lo,Le				
Townsite				Lo	Le
Wild and scenic river:					
Proposed					Lo,Le
Designated				Lo,Le	
Wilderness area				Lo,Le	
Wilderness study area					Lo,Le
Bureau of Reclamation:					
Reclamation withdrawal			Le	Lo	
2d form withdrawal	Lo,Le				
Fish and Wildlife Service:					
Coordination area				Lo	Le
Game range				Lo	Le
National fish hatchery				Lo,Le	
National wildlife refuge				Lo,Le	
Refuges designated as wilderness				Lo,Le	
Geological Survey:					
Reservoir site	Le			Lo	
National Park Service:					
Aid legislation				Lo	Le
National park, monument, and historic site				Lo,Le	
National recreation area				Lo	Le
National seashore				Lo,Le	
Department of Transportation:					
Federal Aviation Administration:					
Air navigation facility				Lo,Le	
General Services Administration:					
Radio relay site				Lo	
Veterans Administration:					
Administration site				Lo,Le	

Le Leasable minerals.

Lo Locatable minerals.

¹Locatable minerals available by lease.²Nonmetallic minerals.

Table B-2.—Mineral use restraints identified in Idaho

No restraints - open or reconveyed (and opened land).
 Reconveyed land but not open to entry.
 Acquired land.

Specific restraints:

Access road withdrawal (FS).
 Administration site (informal, formal).
 Agricultural experiment site.
 Air navigation site or BLM-FAA agreement.
 Airport - strip - application - lease - lease segregation.
 Archaeological Site.
 Area of critical environmental concern - ACEC (informal, formal).
 Aviation lease.
 Birds of Prey National Conservation Area (BOP-NCA).
 Birds of Prey - NCA essential nesting area (BOP-ENA).
 Calving area (eg. Elk).
 Civil projects (Corps of Engineers).
 Classification & multiple use (C & MU) - retention segregation.
 Coal reserve.
 Communication site-radar-radio relay.
 Critical habitat.
 Cultural resource protective area (informal, formal).
 Desert land entry (DLE) with an Idaho BLM file no.
 Designated area.
 Exchange application.
 Experimental forest-land-range-site-station-tract.
 Fish management area.
 Free use permit (FUP).
 Game area/range.
 Geological area-site-rockhound.
 Habitat - big game unroaded.
 Habitat - big game winter/summer.
 Habitat - Grizzly Bear (situation 1).
 Historic site - Nat. Register of.
 Idaho National Engineering Laboratory (INEL-AEC).
 Indian power site irrigation reserve.
 Indian withdrawal (unspecified BIA).
 International boundary area.
 Key habitat.
 Known geothermal resource area (KGRA).
 Material site (community pit, mineral material).
 Military - base/reservation/bombing range.
 Mineral land classification.
 National fish hatchery.
 National grasslands - Curlew.
 National historic site.
 National monument - Craters of the Moon.
 National park - Yellowstone.
 National recreation area - Hells Canyon.
 National recreational area - Sawtooth.
 National recreation trail.
 National wildlife refuge - Bear Lake.
 National wildlife refuge - Camas.
 National wildlife refuge - Deer Flat.
 National wildlife refuge - Gray's Lake.
 National wildlife refuge - Kootenai.
 National wildlife refuge - Minidoka.
 National wildlife refuge - Snake River.
 Natural area.
 Natural research area.
 Nesting site.
 No lease (NOL).

No lease potassium.
 No surface disturbance (NSD).
 No surface occupancy - year long (NSO).
 Not open to entry (NOE).
 Not open to mining (NOM).
 Omitted lands.
 Pioneer area.
 Potassium withdrawal.
 Power project (PP).
 Power site classification (PSC).
 Power site reserve (PSR).
 Primitive area.
 Protective withdrawal (informal, formal).
 Public sale application.
 Public service site.
 Public water reserve (PSR).
 Reclamation project - Arrowrock.
 Reclamation project - Bear River.
 Reclamation project - Boise.
 Reclamation project - Bruneau.
 Reclamation project - E. Greenacres-Rathdrum.
 Reclamation project - Little Wood River.
 Reclamation project - Mann Creek.
 Reclamation project - Michaud Flats.
 Reclamation project - Minidoka.
 Reclamation project - Mountain Home.
 Reclamation project - Owyhee.
 Reclamation project - Palisades.
 Reclamation project - Preston Beach.
 Reclamation project - Rathdrum Prairie.
 Reclamation project - Ririe.
 Reclamation project - Snake River.
 Reclamation project - Teton.
 Reclamation projects 2nd Form.
 Reclamation project (proposed).
 Reconveyed lands (Not Open to Entry).
 Recreation and public purposes (R & PP) -classification- application-lease.
 Recreation area/site.
 Research recreational river.
 Research natural area.
 Research purposes (FS).
 Reservoir site.
 Reservoir site reserve (Res S R).
 Resource protection area.
 Rest stop.
 Roaded/recreation - developed.
 Roaded/recreation - developed - Sawtooth NF.
 Roaded/recreation - low development.
 Roaded recreation - low development - Sawtooth NF.
 Roadless protective area - no off road vehicles.
 Roadless protective area - no roads.
 Roadside zone.
 Scenic travel route.
 Seasonal no surface occupancy (SNSO).
 Semi-primitive area (non-motorized).
 Semi-primitive unroaded recreational area (motorized).
 Semi-primitive unroaded recreational area (non-motorized).
 Small tracts (ST).
 Special interest area.
 Special land use permit (SLUP).
 Special mining management zone.
 Special recreation management area.

Table B-2. - Mineral use restraints identified in Idaho—Continued

State selection application.	Reserved mineral estates:
Steep slopes.	All minerals.
Stock driveway (SD).	All minerals except geothermal.
Streamside zone.	All minerals except oil & gas.
Substation.	All minerals except oil & gas & coal.
Summer range.	Coal only.
Temporary use permit (TUP).	Gas only.
Threatened & endangered species (T&E).	Geothermal only.
Townsite.	Geothermal potassium (K) & sodium (Na).
Trail corridor.	K only.
Transfer of jurisdiction.	K & Na only.
Water - Indian irrigation project.	Leasable minerals only.
Water - irrigation project withdrawal.	Na only.
Water - municipal watershed (informal, formal).	Oil & coal only.
Water power designation (WPD).	Oil & gas only.
Watershed protective area (informal/formal).	Oil & gas & coal only.
Wild & scenic river (informal/formal).	Oil & gas & geothermal only.
Wild river.	Oil & gas & K only.
Wilderness - Frank Church/River of No Return.	Oil & gas & Na only.
Wilderness - Gospel Hump.	Oil & gas & coal & geothermal only.
Wilderness - Hells Canyon.	Oil & gas & K & Na only.
Wilderness - Sawtooth.	Oil & gas & geothermal & K & Na only.
Wilderness - Selway/Bitterroot.	Phosphate (PHO) only.
Wilderness study area - no formal withdrawal.	PHO & oil only.
Wilderness study area - not recommended.	PHO & oil & gas only.
Wildlife management area.	Restricted leasable minerals.
Winter sports area (informal-formal).	Restricted minerals.
Withdrawal - unspecified.	Withdrawn minerals.

APPENDIX C.—GUIDELINES FOR MINERAL USE RESTRAINT CATEGORIES ON FEDERAL LANDS, PREPARED BY THE INTERAGENCY LAND WITHDRAWAL-INVENTORY TASK FORCE

This interagency task force was established to coordinate the land withdrawal inventory and has assigned categories of mineral restraint to Federal land types. These definitions are given in table C-1. They differ

somewhat from the Bureau of Mines definitions in appendix B. Federal mineral land availability in Idaho using the task force definitions is given in table C-2.

Table C-1.—Mineral use restraints and guidelines prepared by the Interagency Task Force

Holding agency and type of land	Available with restrictions	Withdrawn	
		Formal	Informal
Department of Agriculture:			
Agricultural Research Service:			
Administrative site	Le	Lo	
Experimental range or forest	Le	Lo	
Quarantine station	Le	Lo	
Forest Service:			
Administrative site	Lo, Le	Lo	
Designated wilderness area		Lo, Le	
Experimental forest	Le	Lo	
Municipal watershed	Lo, Le	Lo	
National forest system roadless area ¹	Lo, Le		
National recreation area		Lo, Le	
Proposed wilderness area	Lo, Le		
Ranger station	Lo, Le	Lo	
Recreation area and campground	Lo, Le	Lo	
Research natural area	Lo, Le	Lo	
Roadside zone	Lo, Le	Lo	
Townsite Act		Lo, Le	
Department of Defense:			
Air Force:			
Bombing range	Le	Lo	
Military reserve	Le	Lo	
Army:			
Civil project	Le	Lo	
Communication site	Le	Lo	
Military reserve	Le	Lo	
Coast Guard:			
Lighthouse station		Lo	
Navy:			
Bombing range	Le	Lo	
Military reserve	Le	Lo	
Department of Energy:			
Administrative site	Le	Lo	
National petroleum reserves 1, 2, and 3		Lo, Le	
Nuclear regulatory commission	Le	Lo	
Nuclear waste repository		Lo, Le	
Department of the Interior:			
Bureau of Land Management:			
Administrative site	Le	Lo	
Airport application	Le	Lo	
Alaska utility corridor		Lo	
Archaeological site	Le	Lo	
Areas of critical environmental concern	Lo, Le		

Table C-1.—Mineral use restraints and guidelines prepared by the Interagency Task Force—Continued

Holding agency and type of land	Available with restrictions	Formal	Withdrawn Informal
Department of the Interior—Continued:			
Bureau of Land Management:			
Classification and multiple use classification	Le	Lo	
Carey Act	Le		Lo
Coal reserve		Lo	
Communication site	Le	Lo	
Desert land, entry application			Lo, Le
Designated wilderness area		Lo, Le	
Exchange proposal	Le	Lo	
Historic site	Le	Lo	
Indian power site reserve	Lo, Le		
National petroleum reserve- Alaska		Lo, Le	
Oil shale reserve		Lo	
Oil shale withdrawal		Lo	
Outstanding natural area	Le	Lo	
Phosphate reserve	Le	Lo	
Power site classification	Lo, Le		
Power site reserve	Lo, Le		
Primitive area	Le		Lo
Public water reserve	Lo ²		
Recreation and public purpose application or classification			Lo, Le
Recreation areas and campground	Le	Lo	
Research natural area	Le	Lo	
Right of way	Lo		
Severed mineral estate	Lo, Le		
Small tract classification			Lo, Le
State selection application	Le	Lo	
Stock driveway	Lo, Le		
Townsite Act		Lo, Le	
Water power designation	Lo, Le		
Wilderness study area	Lo, Le		
Withdrawal application			Lo, Le
Bureau of Reclamation:			
Reclamation project	Le	Lo	
Fish and Wildlife Service:			
Fish hatchery	Le	Lo	
Game range	Le	Lo	
National wildlife refuge	Le	Lo	
Refuges designated as wilderness		Lo, Le	
National Park Service:			
Aid legislation	Le	Lo	
National historic site		Lo, Le	
National monument		Lo, Le	
National park		Lo, Le	
National recreation area	Le	Lo	
National seashore		Lo, Le	
Department of Transportation:			
Federal Aviation Administration:			
Air navigation site		Lo	
Others:			
National system of trail	Lo, Le		
Recreational river	Le	Lo	
Scenic river	Le	Lo	
Wild river		Lo, Le	

Le Leasable minerals.

Lo Locatable minerals.

¹An environmental assessment is required prior to entry. May vary State-by-State.²Open to metalliferous location.

Table C-2.—Availability of Federal mineral land in Idaho
(Interagency Task Force definitions)

(Thousand acres)

Agency	Available with restrictions	Closed by withdrawal		Total
		Formal	Informal	
LOCATABLE MINERAL LAND				
Department of the Interior:				
Bureau of Land Management	6,162	463	178	6,803
Bureau of Reclamation	--	327	--	327
Fish and Wildlife Service	--	41	--	41
National Park Service	--	91	--	91
Department of Agriculture:				
Forest Service	5,841	5,698	187	11,726
Sheep Experiment Station	--	28	--	28
Department of Defense:				
Air Force	--	110	--	110
Army and Corps of Engineers	--	34	--	34
Department of Energy	--	568	--	568
Other ¹	--	< 1	--	< 1
Total ²	12,003	7,360	365	19,728
LEASABLE MINERAL LAND				
Department of the Interior:				
Bureau of Land Management	6,210	506	160	6,876
Bureau of Reclamation	327	--	--	327
Fish and Wildlife Service	19	22	--	41
National Park Service	--	91	--	91
Department of Agriculture:				
Forest Service	7,337	4,345	12	11,694
Sheep Experiment Station	28	--	--	28
Department of Defense:				
Air Force	110	--	--	110
Army and Corps of Engineers	2	32	--	34
Department of Energy	--	--	568	568
Other ¹	--	< 1	--	< 1
Total ²	14,033	4,996	740	19,769

¹Includes the Federal Aviation Administration, Federal Highway Administration, Immigration and Naturalization Service, and Veterans Administration.

²Federal mineral land routinely considered available for mineral exploration and development is not included in this table. Therefore, this total does not represent the total acres of Federal land in Idaho.

APPENDIX D.—AVAILABILITY OF INDIAN LANDS

Indian lands, as reservations, comprise 821,814 acres or 2% of the land in Idaho (table D-1). Indian lands are held in trust by the Federal Government for the benefit of the individual tribes and are closed to Federal mining and mineral leasing laws. Most reservation lands are available for mineral exploration and development through direct negotiations with the administering tribal council with Bureau of Indian Affairs (BIA) concurrence.

Some Indian reservations were never open to mineral entry. Those that were have since been legally withdrawn from mineral entry under the Federal mining laws, but subject to valid existing rights at the time of withdrawal. Some of these valid (mostly patented) claims may still exist. Some Federal lands still occur within Indian reservations, notably the Coeur d'Alene and Nez Perce reservations. These lands are administered by the BLM

with input from the BIA and the tribes. Such lands may be considered as "split estate" since the surface use is significantly affected by the tribes and the BIA.

Table D-1.—Indian reservations in Idaho

<u>Reservation</u>	<u>Acres</u>
Coeur d'Alene	67,981
Duck Valley ¹	145,706
Fort Hall	522,750
Kootenai	2,072
Nez Perce ¹	85,305
<u>Total</u>	<u>821,814</u>

¹Bureau in-house tabulations.

Source: U.S. Department of the Interior. Annual Report of Indian Lands. Bur. Indian Aff., 1985, 89 pp.

APPENDIX E.—MAJOR FEDERAL LAWS AFFECTING MINERAL EXPLORATION AND DEVELOPMENT

Act of March 3, 1807 (2 Stat. 448)—First mineral land leasing act, reserved lead mines and adjacent areas to Federal Government for future disposal, and provided for their lease to private parties for a limited term. Later related acts reserved other minerals in certain States from sale and/or provided for leasing. Most Federal mineral lands were available by leasing from 1807 to 1846.

Act of April 25, 1812 (2 Stat. 716)—General Land Office was organized as a bureau in Treasury Department. It was transferred in 1849 to the Department of the Interior and abolished in 1946 when its functions were transferred to new BLM. Was responsible for public land laws relating to surveys, disposal, and other activities concerning administration and management of the public land.

Act of July 11, 1846 (9 Stat. 37)—Authorized sale of lead mines in the Upper Mississippi Valley and in Arkansas at public auction for \$2.50 per acre. Other related acts provided for survey and sale of mineral land in various States, and authorized preemptive rights to mineral land. Period of Federal mineral land sales extended from 1846 to 1866. Some mineral land was sold under the agricultural laws, for various reasons.

Act of May 20, 1862 (12 Stat. 392)—Homestead Act of 1862—This and later homestead acts allowed settlers to enter nonmineral public land for agricultural purposes, meet certain conditions for improvements, and obtain patents (title) to the lands, including the minerals, in most cases. Many of these lands have subsequently yielded substantial mineral deposits.

Act of July 26, 1866 (14 Stat. 251)—Mining Act of 1866—All mineral lands of the public domain were declared open to exploration and occupation. The act provided for location of lode mining claims, and upon expenditure of at least \$1,000 in improvements, a patent could be purchased at the rate of \$5.00 per acre. The law allowed only one location per lode and limited each location to 200 ft along the lode or vein.

Act of July 9, 1870 (16 Stat. 217)—Placer Claims Act of 1870—This act amended the Act of July 26, 1866, to include placer locations. It allowed placer claims to conform to legal subdivision on surveyed lands. Placer claims could not exceed 20 acres for any one person or 160 acres for an association of eight or more persons. Payment for patent of placer claims was set at the rate of \$2.50 per acre.

Act of May 10, 1872 (17 Stat. 91)—General Mining Law of 1872—This well-known act replaced much of the 1866 and 1870 laws. It declared "all valuable mineral deposits in lands belonging to the United States...to be free and open to exploration and purchase." It authorized placer

and lode mining claims to be located by a procedure that is largely unchanged to this day. The act also requires that not less than \$100 worth of work be performed on each claim per year. Patents may be issued for lands containing "valuable deposits" upon expenditure of \$500 worth of work. Later acts excluded claims in several States and specifically included various minerals available under the mining laws. The 1872 act remains the method for disposal of minerals in Federal lands that are not specifically provided for in later mineral leasing and sales laws.

Act of March 3, 1877 (19 Stat. 377)—Desert Land Entries Act—Provided for entry and disposal of arid land that is nonmineral in character; if conditions for improvement are met, patent to the land, including the minerals, may be obtained.

Act of March 3, 1879 (20 Stat. 394)—Geological Survey Organic Act—U.S. Geological Survey was established and authorized to study the geologic structure, mineral resources, and products of the national domain, and to classify the public lands.

Act of June 4, 1897 (30 Stat. 34)—National Forest System Organic Act of 1897—Provided for administration and management of the national forest reserves established by Presidential proclamation under the Act of March 3, 1891, to improve and protect the forest, and secure favorable conditions for waterflows and a supply of timber. Administration transferred from the Department of the Interior to the Department of Agriculture in 1905. Vacant unappropriated Federal land in the National Forest System is generally open to entry under the mining and mineral leasing laws, subject to rules and regulations governing the forest. The first major closure of public lands to disposal under nonmineral, but not mineral, land laws.

Act of June 17, 1902 (32 Stat. 388)—Reclamation Act of 1902—Authorized withdrawal of lands for irrigation projects and of all lands believed to be susceptible to irrigation from such projects. The land was segregated from operation of the mining laws, but was open to mineral leasing, with restrictions, since 1920. In addition, the Act of October 2, 1888, as amended, effected an automatic withdrawal of all lands actually designated or selected for reservoirs, ditches, or canals for irrigation purposes, unless otherwise provided by law.

Act of June 8, 1906 (34 Stat. 225)—Antiquities Act of 1906—Provided for protection of cultural resources on Federal lands, specified penalties for violations, and authorized the President to proclaim lands containing historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest as national monuments; such areas were reserved from operation of the

mining and mineral leasing laws, unless specifically provided otherwise.

Act of March 3, 1909 (35 Stat. 844)—This and several later acts, including the Act of July 17, 1914, permitted the separation of surface and mineral ownership (severed estates), allowed agricultural entries on lands withdrawn or classified as valuable for minerals, but reserved the minerals, primarily fossil fuels and fertilizer minerals, for which the lands were considered valuable, to the United States. Severed estates created a later problem in management of public lands.

Act of May 16, 1910 (36 Stat. 369)—**Bureau of Mines Organic Act**—Bureau of Mines was established with duties covering health and safety, conservation, research, and prevention of waste in the mineral industries.

Act of June 25, 1910 (36 Stat. 847)—**General Withdrawal Act (Pickett Act)**—Passed in response to controversy about large withdrawals made under implied Executive authority, the act, as amended by the Act of August 24, 1912, authorized the President to withdraw public land temporarily for various public purposes; the withdrawn land specifically remaining open under the mining laws to metalliferous minerals. In 1942, this authority was delegated to the Secretary of the Interior, who now exercises it for all Federal agencies with their approval on lands in their jurisdiction. Withdrawal of metalliferous minerals from location continued, apart from the Pickett Act, under implied Executive authority.

Act of August 25, 1916 (39 Stat. 535)—**National Park Service Organic Act**—Established the National Park Service to administer existing and future national parks and monuments "to conserve the scenery and the natural and historic objects and the wildlife therein to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Most units of the National Park Service are specifically withdrawn from all mineral development.

Act of December 29, 1916 (39 Stat. 863)—**Stockraising Homestead Act of 1916**—Authorized entries on the public lands for stockraising (grazing) purposes, but unlike earlier homestead acts, reserved all minerals to the United States whether or not the lands were considered to be valuable for any mineral. Federal minerals in these lands are open to location and patent under the general mining laws and to leasing under the mineral leasing laws.

Act of February 25, 1920 (41 Stat. 437)—**Mineral Leasing Act of 1920**—Removed deposits of coal, phosphate, sodium, oil, oil shale, and gas from disposal under the mining laws, and made such deposits subject to a leasing system. The law specifies rental and royalty rates, lease size, and term for each leasable mineral, and it provides for prospecting permits and competitive bidding for certain deposits. Allows the Secretary of the Interior broad

discretion in granting permits and leases. Although later amended to include other minerals and change certain requirements, the act remains the method of disposal of these minerals.

Act of June 10, 1920 (41 Stat. 1063)—**Federal Water Power Act**—Section 24 of the act provided that filing an application for a permit or license for a powersite automatically withdraws the land from all forms of disposal; classification of land as valuable for powersite purposes by USGS also effects a withdrawal under the act. Such withdrawals were opened, with restrictions, by the Mining Claims Rights Restoration Act of August 11, 1955.

Act of March 20, 1922 (16 USC 485)—**General Exchange Act**—Authorized exchange of tracts of areas of Federal lands for lands in private ownership, when lands to be exchanged were appraised at about equal value.

Act of June 14, 1926 (44 Stat. 741)—**Recreation and Public Purposes Act**—Provided for reservation of public lands chiefly valuable for recreational purposes, and for the lease, exchange, or sale of such lands to State and local governments. Minerals in such lands are reserved to the United States and are unavailable under the general mining laws.

Act of December 22, 1928 (45 Stat. 1069)—**Color of Title Act**—Authorized the issuance of patents for public land erroneously held for a specified period in good faith. The minerals may be reserved to the United States or included in the patent.

Act of April 23, 1932 (47 Stat. 135)—Authorized the Secretary of the Interior to open public land withdrawn for reclamation purposes, upon application, to location and patent under the mining laws, subject to some restrictions.

Act of June 28, 1934 (48 Stat. 1269)—**Taylor Grazing Act of 1934**—Marking the end of Federal policy of disposal of nonmineral public land, the Act provided for management of all unreserved public lands, except in Alaska, withdrawal of all vacant public lands for classification (but not from entry under the mining laws), and establishment of grazing districts and the Grazing Service.

Act of July 22, 1937 (50 Stat. 525)—**Bankhead-Jones Farm Tenant Act**—Authorized Federal acquisition of privately owned submarginal farmland; minerals, including hard rock minerals, are available by leasing.

Act of June 1, 1938 (52 Stat. 609)—**Small Tract Act**—Permitted the lease or sale of tracts of public lands of 5 acres or less that were valuable for recreational, home, or business site purposes. All minerals were reserved to the United States and are unavailable under the general mining laws. Classification of land for small tract disposal segregated the land from location under the mining laws. Authority repealed by the Federal Land Policy and Management Act of 1976, but mineral status of patents granted under the Act is unchanged.

Act of June 7, 1939 (53 Stat. 811)—Strategic and Critical Materials Stockpiling Act—Authorized the President to stockpile strategic and critical minerals, and the Secretary of the Interior to investigate and develop new sources of such minerals.

Reorganization Plan No. 3 of 1946 (60 Stat. 1097)—Authorized the Secretary of the Interior to lease, with the concurrence of the Secretary of Agriculture, those Federal minerals in acquired national forest and grassland that, on public lands, are subject to location and disposition under the general mining laws. Also, established Bureau of Land Management with combined functions of the General Land Office and the Grazing Service.

Act of July 31, 1947 (61 Stat. 681)—Materials Act of 1947 (Public Law 291)—Authorized disposal of certain materials, including sand, stone, gravel, and common clay, on public lands by sale, if not otherwise expressly authorized or prohibited by law. Free use of such materials was permitted for noncommercial use by government and nonprofit agencies.

Act of August 7, 1947 (61 Stat. 913)—Mineral Leasing Act for Acquired Lands (Public Law 382)—Authorized the Secretary of the Interior to lease those minerals in all acquired lands that are leasable in public lands under the Mineral Leasing Act of 1920, subject to concurrence of the surface management agency.

Act of August 13, 1954 (68 Stat. 708)—Multiple Mineral Development Act of 1954 (Public Law 585)—Amended the mining and mineral leasing laws to permit multiple development of both locatable and leasable minerals on the same tract of land. If a mineral patent is issued, the leasable minerals are reserved to the United States with the right to recover such minerals. The related Act of August 12, 1953 validated certain mining claims located between 1939 and 1953 on land under a prospecting permit or mineral lease.

Act of August 30, 1954 (68 Stat. 919)—Atomic Energy Act of 1954 (Public Law 703)—Authorized the Atomic Energy Commission, and now the Department of Energy, to issue leases for exploration and mining of fissionable materials on Federal lands.

Act of July 23, 1955 (69 Stat. 367)—Surface Resources Act of 1955 (Public Law 167)—Defined common varieties of sand, stone, gravel, pumice, pumicite, cinders, and clay, and excluded such mineral materials from location under the mining law; they are salable under the Materials Act of 1947. Also, authorized the Government to manage and dispose of any land and surface resources that are not incident to mining on unpatented mining claims.

Act of August 11, 1955 (69 Stat. 679)—Uraniferous Lignite Act of 1955 (Public Law 357)—Permitted location of mining claims for uranium and other fissionable source

materials on public lands classified or known to be valuable for lignite coal.

Act of August 11, 1955 (69 Stat. 681)—Mining Claims Rights Restoration Act of 1955 (Public Law 359)—Provided for location of mining claims on lands withdrawn or reserved for power site development. Mineral development is liable to risk from any future power development. Location of placer claims is subject to additional requirements, and placer mining may be denied by the Secretary of the Interior if such operations would substantially interfere with other uses of the land.

Act of July 20, 1956 (70 Stat. 592)—Provided that any reserved mineral deposit located prior to the Mineral Leasing Act of 1920 is subject to disposal by mineral patent.

Act of August 8, 1956 (70 Stat. 1119)—Fish and Wildlife Act of 1956 (Public Law 1024)—Established the Fish and Wildlife Service in the Department of Interior, and, as amended, authorized the Secretary to take such steps as may be required for development, advancement, management, conservation, and protection of fish and wildlife resources. In addition, the National Wildlife Refuge System Administration Act (Public Law 89-669; 80 Stat. 926) authorized the Secretary to permit other uses of these lands, provided such uses are compatible with the purposes for which such areas were established.

Act of February 28, 1958 (72 Stat. 27)—Defense Withdrawal Act of 1958—Withdrawals or reservations aggregating more than 5,000 acres for any one defense project or facility can only be made by Act of Congress. Minerals on all withdrawals or reservations for the Department of Defense are subject to disposition under the mining and mineral leasing laws, except where the Secretary of Defense, after consultation with the Secretary of the Interior, determines that such disposition is inconsistent with military use of the lands.

Act of August 21, 1958 (72 Stat. 700)—Authorized the Secretary of the Interior to develop a program to encourage exploration for mineral reserves by private industry.

Act of March 18, 1960 (74 Stat. 7)—Placer Claims Mill-site Act of 1960 (Public Law 86-390)—Provided for location and patent of up to 5 acres of nonmineral land in connection with a placer mining claim.

Act of June 12, 1960 (74 Stat. 215)—Multiple-Use, Sustained-Yield Act of 1960 (Public Law 86-517)—Directed the Secretary of Agriculture to develop and administer the renewable surface resources of the national forests for multiple use and sustained yield, giving due consideration to the relative values of the various resources in particular areas. Wilderness areas are consistent with the act; the act does not affect the use or administration of the mineral resources of national forest lands.

Act of October 23, 1962 (76 Stat. 1127)—Mining Claim Occupancy Act of 1962—Authorized the Secretary of the Interior to convey up to fee simple title to residential occupants of unpatented mining claims on which valuable improvements have been made.

Act of December 17, 1963 (77 Stat. 392)—Clean Air Act (Public Law 88-206)—Established a national program to control air pollution. Under the act, as amended, standards are set for air quality and attainment status is determined by area. Permits are required for new sources of air pollution, including mining and milling operations.

Act of September 3, 1964 (78 Stat. 890)—Wilderness Act (Public Law 88-577)—Created the National Wilderness Preservation System and provided for its administration in such manner as will leave it unimpaired for future use and enjoyment as wilderness. All Federal lands in the system were closed to operations under the mining and mineral leasing laws, subject to valid existing rights, after 1983. Subsequent acts have added considerable Federal land to the system.

Act of September 19, 1964 (78 Stat. 986)—Classification and Multiple Use Act of 1964—Authorized the Secretary of the Interior to classify and manage Bureau of Land Management land for retention or for disposal, and for multiple use, including specification of dominant uses and preclusion of inconsistent uses in an area. Classification segregated the lands from operation of the mining and, in some instances, the mineral leasing laws.

Act of October 15, 1966 (80 Stat. 915)—National Historic Preservation Act of 1966—Expanded Federal support for historical preservation through the National Register of Historic Places, a list of places protected from destruction by any project involving Federal action. All agencies must review the effect of a project on any district, site, building, structure, or object on the National Register.

Act of October 2, 1968 (82 Stat. 906)—Wild and Scenic Rivers Act of 1968 (Public Law 90-542)—Created the Wild and Scenic Rivers System to preserve parts of designated rivers from further development; the system is managed to preserve scenic or other values that justified designation. Minerals in Federal land within 0.25 mile of each bank are withdrawn under the mining and mineral leasing laws. Proposed river corridors are segregated, also, pending study.

Act of January 1, 1970 (83 Stat. 852)—National Environmental Policy Act of 1969 (Public Law 91-190)—Declared a national policy of "productive and enjoyable harmony between man and his environment." Requires a detailed analysis for all "major Federal actions significantly affecting the quality of the human environment." Many activities under the mining and mineral leasing laws are subject to the act; substantial costs have resulted from required environmental studies and mitigation of environmental impacts.

Act of December 24, 1970 (84 Stat. 1566)—Geothermal Steam Act of 1970 (Public Law 91-581)—Authorized the leasing of geothermal resources and associated byproducts in public lands through competitive and noncompetitive leasing systems. The Geothermal Energy Research, Development, and Demonstration Act of 1974 promoted the development and utilization of geothermal resources.

Act of December 31, 1970 (84 Stat. 1876)—Mining and Minerals Policy Act of 1970 (Public Law 91-631)—Declared that the Federal Government policy is to encourage private enterprise in the development of (1) a sound and stable domestic minerals industry, (2) domestic mineral deposits, (3) minerals research, and (4) methods for reclamation in the mineral industry.

Act of October 18, 1972 (86 Stat. 816)—Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500)—Established a program to control pollution by limiting the amount of effluent that may be discharged into a body of water. Permits are required for the discharge of water from point sources including mining and milling processes. The related Safe Water Drinking Act of 1974, as amended, also requires permits for injection wells for oil and gas operations and for special wells for solution mining, in situ gassification, and recovery of geothermal energy.

Act of December 28, 1973 (87 Stat. 884)—Endangered Species Act of 1973 (Public Law 93-205)—Established a policy to conserve endangered and threatened species of plants and animals. The act, as amended, provides for determination of such species and designation of their critical habitat, and prohibits any Federal action modifying such critical habitat, unless exempted by a cabinet-level committee. Affects any mining activity requiring Federal action.

Act of August 4, 1976 (90 Stat. 1083)—Federal Coal Leasing Amendments Act of 1976 (Public Law 94-377)—Amended the Mineral Leasing Act of 1920 to change the procedure for leasing coal on Federal lands, to provide for fair market value and diligent development on Federal coal leases, and to coordinate management of coal mining with land use plans.

Act of September 28, 1976 (90 Stat. 1342)—Mining in the National Parks Act (Public Law 94-429)—Closed certain national parks and monuments to mining, imposed a moratorium on mineral exploration and development, and established requirements on mining in national parks and monuments where still allowed.

Act of October 21, 1976 (90 Stat. 2743)—Federal Land Policy and Management Act of 1976 (Public Law 94-579)—The act, also known as the Bureau of Land Management (BLM) Organic Act, established a comprehensive procedure for the inventory, analysis, planning, and management of BLM lands. Repealed most previous public land laws, set up a comprehensive land planning system, controlled

withdrawal procedures more closely (and repealed the implied authority of the President to make withdrawals), required recordation of mining claims with BLM, and authorized the Secretary of the Interior to establish a regulatory program to "take any action necessary to prevent unnecessary or undue degradation of the lands."

Act of October 21, 1976 (90 Stat. 2795)—Resource Conservation and Recovery Act of 1976—Established a Federal program for management of solid waste, prohibited future open dumping, and defined and regulated hazardous waste closely. Some mining waste is excluded, but other mining waste is included. The related Comprehensive Environmental Response, Compensation and Liability Act of 1980 (the Superfund Act) provided that Federal or State Governments may bring claim for any damage to natural resources under their trusteeship caused by release of hazardous substances.

Act of October 22, 1976 (90 Stat. 2949)—National Forest Management Act of 1976—The act, which supplements and amends the Forest and Rangeland Renewable Resources Planning Act of 1974, provided a comprehensive framework and prime source of direction to the Forest Service through required land and resource management planning to achieve effective use of renewable resources and National Forest Service land. Required the Secretary of Agriculture to set planning regulations; standards and guidelines in the regulations must be incorporated into land and resource management plans.

Act of August 3, 1977 (91 Stat. 445)—Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87)—Established the Office of Surface Mining in the Department of Interior to administer reclamation of all surface-mined coal lands. Authorized a fund for abandoned mine reclamation, standards for environmental protection, requirements for reclamation plans, and designation of areas unsuitable for mining.

Act of November 9, 1977 (91 Stat. 1290)—Federal Mine Safety and Health Amendments Act of 1977—Repealed or amended the previous mine safety and health acts of 1966 and 1969. Created the Mine Safety and Health Administration in the Department of Labor, responsible for enforcement of the mine health and safety laws.

Act of November 8, 1978 (92 Stat. 3021)—Uranium Mill Tailings Radiation Control Act of 1978—Established a remedial action program for uranium mill tailings at certain inactive sites and a uranium mill tailings license and regulatory program, administered by the Nuclear Regulatory Commission.

Act of October 21, 1980 (94 Stat. 2305)—National Materials and Minerals Policy, Research and Development Act of 1980 (Public Law 96-479)—Reaffirmed a national policy to foster promotion of domestic materials, minerals, and mineral reclamation industry under private enterprise. Among specific points, Federal agencies are encouraged to "facilitate availability and development of domestic resources to meet critical materials needs."

Act of November 6, 1986 (100 Stat. 3457)—Military Lands Withdrawal Act of 1986 (Public Law 99-606)—Directed the Secretary of the Interior to determine, with the concurrence of the Secretaries of the military departments concerned, which lands in certain military reservations are suitable for mineral location and/or mineral leasing.

Act of December 22, 1987—Federal Onshore Oil and Gas Leasing Reform Act (Subtitle B of Title V of Public Law 100-203)—Amends the Act of February 25, 1920, so that the Secretary of the Interior may not issue, over the objection of the Secretary of Agriculture, any lease on National Forest System lands reserved for the public domain. The act also formally closes Wilderness Study Areas to oil and gas leasing.

APPENDIX F.—AVAILABILITY OF FEDERAL LAND IN IDAHO BY AGENCY

The degree of availability of Federal lands for mineral exploration and development is dependent on the primary mission of the agency having management responsibility.

Unappropriated Federal lands (public domain) have the fewest restrictions and are managed according to principles of multiple-use management by either the Bureau of Land Management or the Forest Service. These lands are open to location and available for lease. Other lands managed by these two agencies, and almost all lands managed by any other Federal agency, are either withdrawn or have some type of restraint on mineral location or lease, or both, according to the degree of compatibility of mineral exploration and development with the designated use of the lands.

The mineral management policies of the Federal agencies with significant land management responsibilities in Idaho are discussed below.

BUREAU OF LAND MANAGEMENT (BLM)

The BLM manages 14.2 million acres of public domain, acquired, and reconveyed lands through its Idaho State Office and six district offices. BLM-managed lands in the State are further divided into resource areas, each with an area manager and staff. Table F-1 shows the Federal mineral acreage by district and land type (public domain, acquired, or reconveyed but not open to entry). The acreage figures for public domain include reconveyed lands that have been opened for mineral entry. The table represents lands available for location and lease, because their acreage figures are almost equal.

Table F-1.—Federal mineral lands managed by the Bureau of Land Management in Idaho¹

Administrative unit (district)	(Thousand acres)			
	Total	Public domain	Acquired	Reconveyed, not open to entry
Boise	5,804	5,804	<1	0
Burley	1,512	1,434	73	5
Coeur D'Alene . . .	586	582	4	<1
Idaho Falls	2,995	2,993	<1	2
Salmon	1,331	1,331	<1	<1
Shoshone	1,989	1,988	<1	<1
Total	14,217	14,132	78	7

¹Bureau in-house tabulation.

Land Use Planning

The Federal Land Policy and Management Act (FLPMA) is the basic statute that governs BLM planning

and management of the Federal lands and minerals under its jurisdiction. The act emphasizes multiple-use management and environmental protection through comprehensive land use planning procedures. Planning is accomplished at the resource area and district office levels through preparation of a combined resource management plan and environmental impact statements (RMP/EIS) for each entity. Decisions allowing certain resource uses while denying or restricting others are based on relative resource values and other factors, and are incorporated into the RMP/EIS to define management goals. Thus, availability of land for mineral exploration and development depends on the degree and kind of conflicts perceived between development of mineral values and impacts on other resources, and the legal options available to the manager in each case. In Idaho, the BLM planning process is under way on most management units, and interested parties should contact the appropriate BLM office for current planning status.

Management of Mineral Resources

Rights to mineral entry and development are obtained either by location of mining claims or by lease, depending upon the mineral sought and the type of lands involved. With the exception of acquired lands and reconveyed lands not open to entry, all BLM lands are available for location unless specifically withdrawn. The BLM has little discretion over where claims are located on lands open to location. However, once a claim is located, mineral exploration and development activities are regulated under 43 CFR 3800 to prevent unnecessary and undue degradation of the Federal land.

Most BLM lands in Idaho are available for lease. Currently, phosphate, oil and gas, and geothermal resources within a KGRA are available for lease through competitive bidding; areas outside KGRAs are available for these minerals without competitive bidding. On most acquired lands, all minerals are accessible only by lease, subject to the discretion of the agencies involved and to stipulations to protect the environment. Mineral leasing activities are regulated by 43 CFR 3100 for oil and gas resources and 43 CFR 3200 for geothermal resources.

Restrictions on BLM Land

In general, BLM lands are open to mineral exploration and development under multiple-use management principles, but significant portions are either unavailable or restricted. The largest category of BLM land where both location and lease activities are severely restricted is the 4.8 million acres of BLM wilderness study areas (WSAs).

Because of this, the mining industry generally has little interest or incentive in locating claims or obtaining leases in WSAs under present policy, because WSAs are managed under strict control to maintain their wilderness character pending final determination of their status. Public Law 100-203 prohibits oil and gas leasing on WSAs. On the plates, these areas are shown as unavailable or severely restricted by management decision. These areas are also legally unavailable for oil and gas lease.

Most other withdrawals on BLM lands are somewhat smaller and usually scattered. Included are Federal agency protective withdrawals; Recreation and Public Purposes Act; Small Tract Act; powersite withdrawals (including powersite reserves, classifications, and projects); administrative, communication, and recreation sites; mineral material areas; and areas of wildlife, botanical, scenic, and cultural concern.

The BLM "Withdrawal Review Inventory" of formally withdrawn areas lists all BLM lands withdrawn from mineral location and leasing by authorities, subject to FLPMA review. This review is under way and requires justification for continuing individual withdrawals, or revocation and restoration of the lands to mineral and other forms of entry.

FOREST SERVICE (FS)

The FS manages 20.3 million acres of public domain, acquired, and reconveyed lands in Idaho. There are 13 forest management units in Idaho. Three forests, the Coeur d'Alene, Kaniksu, and the St. Joe were consolidated into the Panhandle National Forests unit. Parts of the Cache (UT), Kootenai and Bitterroot (MT), and the Wallowa-Whitman (OR-WA) occur mostly outside the State. Table F-2 shows the Federal mineral acreage by forest and land type.

Management of Mineral Resources

Like BLM-managed lands, FS-managed lands are generally available for mineral exploration and development under the mining and mineral leasing laws. The FS Organic Act of 1897 specifically states that these lands shall continue to be open to entry under the General Mining Law of 1872. Specific FS minerals management responsibilities on Forest System lands are (1) to make lands available for exploration and development of mineral resources, (2) to manage surface-use operations to minimize adverse environmental impacts and ensure proper reclamation of disturbed lands, and (3) to determine the validity of mining claims. The BLM has final authority for administration of the mining laws, but an April 1957

memorandum of understanding between the two agencies provides for joint administration of the mining laws on FS lands.

Table F-2.—Federal mineral lands managed by the Forest Service in Idaho¹

(Thousand acres)				
Administrative unit (district)	Total	Public domain	Acquired	Reconveyed, not open to entry
Bitterroot (MT) . . .	466	466	<1	0
Boise	2,174	2,131	43	0
Caribou-Cache-Curlew	1,285	1,240	45	0
Challis	2,677	2,677	<1	0
Clearwater	1,667	1,635	32	0
Kootenai (MT) . . .	46	46	0	0
Nez Perce	2,210	2,206	4	0
Panhandle	2,485	2,225	260	0
Payette	2,299	2,298	1	0
Salmon	1,778	1,778	<1	0
Sawtooth	1,933	1,926	7	2
Targhee	1,294	1,294	<1	0
Wallowa-Whitman (OR-WA)	3	3	0	0
Total	20,317	19,925	392	2

¹Bureau in-house tabulation.

FS regulations pertaining to surface use of national forest lands in connection with mineral operations are promulgated in 36 CFR 228. For locatable minerals, regulations require a notice of intent if operations might cause a disturbance of surface resources, and a plan of operations if the operator is likely to cause a significant disturbance. The FS reviews applications for leases and permits, notices of intent, and operating plans submitted by the mineral industry, and establishes stipulations as needed to protect surface resources.

Restrictions on FS Lands

Legally unavailable lands include designated wilderness areas and lands withdrawn from mineral entry for various purposes, including recreation and administrative sites; experimental forests, grasslands, and watersheds; and areas of cultural, scenic, or botanical interest. Some of these areas may be available to mineral leasing, with or without special stipulations, whereas others may be unavailable to all forms of mineral entry.

Lands unavailable or severely restricted by management decisions include areas designated as "no lease" or "no surface occupancy" (high erosion or geologic hazard, low visual absorption capacity, or habitats of endangered or

threatened species). The FS will recommend against leasing where operational damages would be irreversible.

SHEEP EXPERIMENT STATION (SES)

The Sheep Experiment Station is administered by the Department of Agriculture and encompasses 27,861 acres. These lands are legally withdrawn from location, sale, or entry by Executive orders. Prior valid claims and other existing rights within the Station were not extinguished by the orders. The Station management direction severely restricts mineral leases.

DEPARTMENT OF DEFENSE (DOD)

The DOD administers 144,017 acres of Federal mineral lands in Idaho (Table F-3). The principal military installation is the Mountain Home Air Force Base and associated ranges. Federal minerals in these lands, and lands administered by the Army Corps of Engineers, are under the jurisdiction of the Secretary of Interior, with all dispositions made under the authority of applicable mining and leasing laws. However, entries and applications for leases will be denied if the Secretary of Defense, after consultation with the Secretary of Interior, determines that such disposition or activity is inconsistent with the military use of the lands so withdrawn or reserved (43 U.S.C. 158, 1970). In practice, this is almost always the case. If applications are granted, severe restrictions may be imposed on any leases approved to ensure compatibility with military needs and requirements. Consequently, although some DOD lands are not formally withdrawn to mineral entry, most are considered in this study to be unavailable or severely restricted.

Table F-3.—Federal mineral lands managed by the Department of Defense in Idaho¹

<u>Administering agency and name of facility</u>	<u>Acres</u>
Air Force:	
Mountain Home Air Force Base	3,680
Mountain Home AFB Small Arms Range	1,622
Mountain Home AF Range No. 3	102,747
Saylor Creek Air Force Range	<u>1,920</u>
Subtotal	109,969
Army:	
National Guard	1,726
Corps of Engineers dams, reservoirs, miscellaneous ..	32,322
Total	144,017

¹Bureau in-house tabulation.

FISH AND WILDLIFE SERVICE (FWS)

The FWS manages 40,969 acres of Federal mineral lands (Table F-4). About 19,228 acres of the total are also managed by the BOR. All of these lands are legally unavailable to location pursuant to 43 CFR 3101. Oil and gas development permits are reviewed by FWS on a case-by-case basis for compatibility with land use, pursuant to 50 CFR 32 and 2921. Specific restrictions would be included in the permit.

Table F-4.—Federal mineral lands managed by the Fish and Wildlife Service in Idaho¹

<u>Project-Sanctuary Name</u>	<u>Acres</u>
Bear Lake	17,017
Camas	1,080
Deer Flat	2,976
Gray's Lake	40
Kooskia Fish Hatchery	124
Kootenai	160
Minidoka	<u>19,572</u>
Total	40,969

¹Bureau in-house tabulation.

NATIONAL PARK SERVICE (NPS)

The NPS manages 90,819 acres in three units in Idaho (table F-5). In general, all NPS lands are either withdrawn from location and mineral leasing by the NPS Organic Act of 1916 or by the enabling legislation for each individual park or monument area. Prior valid mining claims and other valid existing rights within park areas, however, were not extinguished by the enabling acts. All units in Idaho are now legally withdrawn from location and mineral leasing.

Table F-5.—Federal mineral lands managed by the National Park Service in Idaho¹

<u>Unit</u>	<u>Acres</u>
Craters of the Moon National Monument	53,562
Nez Perce National Historical Parks	114
Yellowstone National Park	<u>37,143</u>
Total	90,819

¹Bureau in-house tabulation.

BUREAU OF RECLAMATION (BOR)

Although first form withdrawals cover approximately 346,305 acres of Federal mineral lands in Idaho, the BOR

manages about 19,272 acres with other agencies. Of the 327,033 remaining acres, about 260,349 acres occur on BLM lands and 76,684 acres on FS lands. The lands managed with other agencies were assigned to those agencies; they include 19,228 acres on FWS lands, 39 acres on DOD (Air Force) lands, and 5 acres on lands managed by the FAA. In general, BOR lands are legally unavailable to mineral location by first form withdrawal (section 3, Reclamation Act of June 17, 1902; 32 Stat. 388). All BOR lands are legally available for oil, gas, and geothermal leasing; however, the BOR has some discretion concerning leasing, and the lands are considered slightly to moderately restricted. After a project is completed, a determination is made as to which lands are essential to the project and the extent that mineral leasing activities would interfere with its purpose. After consultation with the BLM, stipulations are imposed on the leases to protect the project and any surface resources that are present.

DEPARTMENT OF ENERGY (DOE)

The DOE manages 568,109 acres of Federal mineral lands at the Idaho National Engineering Laboratories. In general, DOE lands are legally unavailable to location and leasing pursuant to the Pickett Act and Executive Order 10355 of May 26, 1952, which gave the President and his

authorized officer, the Secretary of Interior, the general authority to withdraw public lands from mineral entry or other reasons for public purposes.

OTHER FEDERAL AGENCIES

Four Federal agencies administer the remaining 759 acres of Federal lands in Idaho. In general, the small, scattered tracts are dedicated to specific uses. Many are legally unavailable to location, and some are legally unavailable to mineral leasing; the remainder are considered in this report to be unavailable to location and mineral leasing by management decision. Table F-6 lists these agencies and the acreage they manage.

Table F-6.—Federal mineral lands managed by other Federal agencies in Idaho¹

<u>Agency</u>	<u>Acres</u>
Immigration and Naturalization Service	386
Department of Transportation:	
Federal Aviation Administration	239
Federal Highway Administration	24
Veterans Administration	<u>110</u>
Total	759

¹Bureau in-house tabulation.

APPENDIX G.—SIGNIFICANT MINERAL DEPOSITS

Areas identified by number on plates 1 and 2 correspond to KMDAs considered high or medium in value (or potential for certain leasable minerals). Mines and deposits used to identify the KMDAs are listed in tables G-1 and G-2. All significant mines or deposits may not be listed, nor are all listed mines or deposits equal in economic importance. The mine and deposit names listed are for the convenience of the reader and do not comprise a complete inventory of all Idaho mines and deposits.

Commodities for each KMDA (tables G-1, G-2) are ranked in order of economic importance, based on 1981 commodity prices, which were current when the first report of this series was prepared. This allows direct comparison of deposit values from State to State, but also tends to bias those deposits that have produced precious metals because of their high prices that year.

The production and/or resource value is based, in most cases, on published information. Company confidential data are not shown, or when used, are included only in combined totals so that confidentiality can be maintained; this data is not available for public inspection.

Although some KMDAs with identified resources have had little or no production, the values produced usually make up a significant part of reported totals. Dollar values in tables G-1 and G-2 are for recorded production and identified resources within the listed areas. The stated values, therefore, do not represent estimates of the total mineral wealth that may be present in the KMDA. Also, the absence of a KMDA in an area does not preclude the presence of economically important mineral properties. Numerous gem stone operations are not included because the locations are generally proprietary.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
1	Continental, Farmer Jones, Freeman Lake, Granite Creek, Lakeview No. 1, Little Grass Mountain, Plowboy, Shannon, Woodrat.	Au, Ag, Cu, Pb, Zn, Mo, Be O, Silica	47.6
2	Bethlehem, Big T, Boulder Creek placers, Buckhorn, Chief Joseph, Hall Mountain, Kate Fry, Lead Mill, Miller Brothers, Montgomery, North Skin Creek, Railroad, Regal, Skin Creek, Tilley.	Au, Ag, Cu, Pb, Zn, Ni, Th, WO ₃	165.9
3	Antelope, Auxer, Blacktail, Brown Bear, Chilco Moly, Complex, Conjecture, Copper Giant, Falls Creek, Goat Mountain, Gold Coin, Gold Creek, Green Monarch, Hidden Treasure, Homestake, Hope and Faith, Hope, Hypotheek, Idaho Lakeview, Iron Mask, Keep Cool, Last Stand, Lawrence, Little Senator, Minerva & Whalen, Minerva, Opportunity, Pend Oreille, Plume Creek, Red Cliff, Silver Butte, Silver Fox, Silver Leaf, Talache, Vulcan, Weber, Whitcomb, Whitedelph.	Au, Ag, Cu, Pb, Zn, Sb, Mo, Silica	413.7
4	Caribou, Murphy Tungsten, Silver King, Silver Strand	Au, Ag, Cu, Pb	3.7
5	Accident, Ajax, Alhambra, Alice, Ambergris, American Silver, Amy-Conjecture, Copper Giant, Falls Creek, Goat Mountain, Gold Matchlees, Anchor, Argentine, Arizona, Atlas, Beacon Light, Bear Top, Beehive placer, Benton, Big Elk, Big It, Blackhawk, Blue Grouse, Blue Sky, Bobby Anderson, Buckeye, Bullion, Bunker Hill, Burke, Caladay, Caledonia, California, Canyon Silver, Castle Rock, Chester, Coeur d'Alene Big Creek, Coeur, Consolidated, Constitution, Crescent, Crown Point, Crystal Lead, Dayrock, Denver, Douglas, Eagle Creek, Evolution, Friday, Frisco, Galena, Gem State, Giant Ledge, Gibbonsville, Golconda, Gold Back, Gold Circle, Gold Hunter, Golden Chest, Golden Reward, Granada, Great Dunkard, Hansey, Hecla, Hercules, Highland-Surprise, Hilarity, Horst-Powell, Hultner Ranch, Hummingbird, Idora, Independence, Interstate, lone, Jack Waite, Kismet, Last Chance, Liberal King, Liberty, Little Pittsburg, Lookout Mountain, Lucky Friday, Lucky Strike & Lake Creek, Lynch-Pine Creek, Marsh, May Claim, Merger, Metropolitan,	Au, Ag, Cu, Pb, Zn, Sb	22,114.0

See footnotes at end of table.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)—Continued

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
	Midnite, Moe, Monarch, Monitor, Mother Lode, Mountain Goat, Mullan Metals, Murray, Nabob, National, Nellie, Nepsic, Nine Mile, Northern Light, O.K., Ontario, Oro-Fino, Page, Paragon, Parrott, Pilot, Polaris, Pontiac, Pony Gulch, Rainbow, Red Monarch, Reindeer Queen, Rex, Richmond, Rock City, Royal, Ruth, Senator Stewart, Sherman, Sidney, Sierra Nevada, Silver Cliff, Silver Crescent, Silver Crystal, Silver Dollar, Silver Scott, Silver Star, Silver Strike, Silver Summit, Silver Syndicate, Silver Tip, Silverado, Sisters, Sitting Bull, Sixteen-To-One, Snowstorm, Spokane, St. Elmo, Standard-Mammoth, Stanley, Star-Morning, Stem Winder, Success, Sunset, Sunshine, Sweeney, Tamarack, Taylor, Tiger-Poorman, Toughnut, Treasure Vault, Vindicator, Virginia, Washington-Idaho, West Mammoth, West Star, Western Union, Wyoming, Zanetti.		
6	LeFors, McCleary Butte	Fe	> 100.0 ¹
7	Carpenter Creek, Emerald Creek	Garnet, Gem stone	> 2.0 ¹
8	Carrico, Gold Hill, Jerome Creek placer, McKinney, Prosperity ..	Au, Ag, BeO, WO ₃	1.2
9	Mary Lee, Mizpah, Peacock, Poorman placer	Au, Ag, Cu	1.0
10	Muscovite, Witherow	Mica, BeO	> 5.0 ¹
11	Goat Mountain-Blackdome Ridge, Gueda, Monumental Ridge, Smith Ridge.	Kyanite, Gem stone	4.0 ²
12	Cedars-Kelley Creek	Silica	1.0 ²
13	Jerico	Au	> 1.0 ¹
14	Cedar Creek placer, Dewey, Dick Creek placer	Au, Ag, Monazite	> 1.0 ¹
15	Allgood, American placer, Black Dome, Bole, Bond, Eldo placer, French Creek, Gold Creek, Musselshell placers, Orofino Creek, Ozark, Quartz Creek, Reeds Creek, Santiago, Snake Creek, Wild Rose, Woodchuck placer.	Au, Ag, Fe, Mn, Monazite, Zircon, BeO	> 100.0 ²
16	Tri-Metallic	Au, Ag	< 1.0 ¹
17	Kamiah, Pete King Creek placer, Smith Creek, Woodrat Mountain	Asbestos, Monazite, Zircon, Kyanite, Fe, Nb	74.9
18	Copper Springs, Deer Creek, Rosebud	Au, Ag, Cu	< 1.0 ¹
19	Imnaha Rapids, Monte Cristo	Au, Ag, Cu	> 1.0 ¹
20	Butcher Bar placers, John Day Bar placer, Large Bar placer, Lucile Bar placer, McKinley, Pine Bar Rapids, Sherwin Bar placer, Spring Bar placer, Virginia, Wild Cat placer.	Au, Ag	24.3
21	Dewey, Grouse Creek placer, McComas, Pullman, Sylvia Ellen, Wickieup Creek.	Au, Ag, Cu, Pb, Fe	249.3
22	Alpha, American, American Eagle, American Hill placer, Anaconda, Arrastre, Banner, Behrens placer, Bengal, Black Diamond, Black Lady, Black Pine, Blackbird, Blue Jay, Blue Jay/Sterling Silver, Blue Ribbon, Bonanza, Brown Bear, Buckeye placer, Buckhorn, Buffalo Gulch, Bulldog, Buster, Butte and Orogrande, Center Star, Coeur d'Alene, Colonel Sellers, Crooked River placer, Deadwood Mountain, Del Rio, Diamond Hitch, Dixie, Dixie Queen, Dixie Royal, Eldorado, Erickson Reef placer, Fourmile, Friday, Frisco, Gnome, Gold Leaf, Golden Eagle, Grangeville, Happy Day placer, Haystack, Hematite, Homestake, Hope, Hundred Dollar Gulch placer, Idaho Comstock, Idaho-Champion, Iron Crown, J & M placer, Johnson placer, Key placer, L & L, Legget Creek placer, Little Butte, Little Elk Creek placer, Little Moose placer, Lone Pine, Lucky Strike, Mackey, Madre d'Oro, Major, Mammoth, Mascot, Midas placer, Mineral Zone, Moose Creek placers, Mountain Joy, New York, Newsome Creek, North Hill, Nugget Gulch, O.K., Ontario, Ophir, Orogrande-Frisco, Pasadena, Penman, Petsite, Pioneer, Portland, Red Bee placer, Red River	Au, Ag, Cu, Pb, Zn, Monazite, Zircon	3,040.5

See footnotes at end of table.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)—Continued

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
23	placers, Red River, Relief Creek placer, Revenue, Robinson, Ross, Sentinel, Shuck placer, Sixty Four, Skylark, Slip Easy, South Fork, Tippie placer, Trout, Tungstar, Union, Upper Red River placers, War Eagle, Waverly, Wild Hope, Wonder, Zenith. Alaska, Allison Gulch, Ants Creek, Arkansaw-Decorah, Azurite, Blakely, Blue Jacket, Calumet, Carbonate Hill, Cliff, Copper Cliff, Copper Queen, Davis Rapids, Dry Diggins placer, Dry Gulch, Eureka, Golden Star, Helena, Lime Peak, Lockwood, Lower Devils Hollow, Lucky Strike, Maid of Erin, Mine 1905, Old Timer, Peacock, Pepperbox No. 2, Placer Basin, Red Ledge, River Queen, Russell, South Peacock, Victory.	Au, Ag, Cu, Pb, Zn, WO ₃	1,452.8
24	Banner, Bear Track, Big Three, Black Sand Creek, Bullion, Buttercup Placer, Elk Horn, Gilt Edge, Gold Bug, Gross Creek placer, Mikado, Miller Creek placer, Montana, Montrose, Morning Sun, Ozark, Redwing, Sand Creek placer, Shamrock placer, Yakima.	Au, Ag, Cu, Monazite	25.5
25	Atlas, Big Buffalo, California, Cracker Jack, Jumbo, North Star, Spokane, St. Louis.	Au, Ag, Cu, Pb	13.4
26	Blue Bird Bar placer, Disappointment Bar placer, Elkhorn Bar placer, Haney Bar placer, Jackson Bar placer, Moore Bar placer, Painter, South Fork placers.	Au, Ag	4,101.4
27	Ajax Gambler, Anderson, Big Four, Bull of the Woods, Clara Morris, Corn Beef, Gibbonsville, Golden Reward, Hughes Creek, McCarthy, Ransack Creek placer, Red Fox placer, Red Star, Sheep Creek, Threemile Creek placer, Twin Brothers, Watson.	Au, Ag, Cu, Pb	8,082.4
28	Blue Gulch, Cora Gulch, Curren Mountain, McCrea, Oregon. . . .	Au, Ag, Cu, Zn	7.6
29	Alberta, Arlise, Bear Track, Bullion Silver, California Creek, Daisy, Delaware, Emly, Gold King, Gold Run, Golden Anchor, Golden Rule, Hoodoo placer, Horsefly, Iola, Jewell, Kelly Meadows placer, Kingfish, Lake Creek, Last Chance, Leadville, Liberty, Little Giant, Lucky Ben, Minnehaha, New Era, Old Kentuck, Old Rescue, Pearl, Rainer, Ruby Meadows placer, Schissler Creek, Secesh placer, Sherman Howe, Silver King, Sluicibox, Squaw Meadows placer, Steamboat Creek, Summit, Unity, Waln, War Eagle, Warren Meadows placer, Warrior.	Au, Ag, Cu, Pb, Fe, U, Nb, Monazite, Zircon	171.9
30	Hand, Little Sheepeater	Au, Ag, Pb	>2.0 ¹
31	Antimony Ridge, Dewey, Eagle, Fern, Garnet Creek, Golden Gate, Hermes, Imperial, Meadow Creek, Monumental Summit, Mule Creek, Rare Earths, Fluorspar Oberbillig, Profile Gap, Red Mountain, Sheepeater, Smith Gulch Bar placer, Smothers, Sunnyside, West End, Yellow Pine.	Au, Ag, Cu, Pb, Zn, Sb, Hg, WO ₃ ,	2,722.0
32	Golden Eagle placer, Golden Queen placer, Kitchen Creek Bar placer.	Au, Ag	<1.0
33	Arnett placer, B & B, Badger, Best Bet, Bevan, Big Four, Big Bear Lead, Blackbird, Blackpine, Blue Jay, Bohannon, Boulder, Boulder Creek, Boulder Creek placer, Breccia Gold, Brown Bear Clipper Bullion, Contact, Copper Camp, Copper King, Delmar, Ditch Creek, Dokka, Goff Brothers placer, Gold Bug, Gold Crown, Gold Flint, Gold Hill, Gold Ridge, Golden Bear, Green Jacket, Grunter, Hilltop, Idaho-Rainbow, Iron Clad, Iron Dike, Italian, Kentuck, Kitty Burton, Lang, Last Chance, Little Chief, Little Gem No. 7, Mary Ann, McConn Creek, McNutt, Mohawk, Monolith, Moose Creek placer, Moscow, Mulligan, Musgrove Copper, Nabob, Napias Creek placer, Never Sweat, Orofino, Olander Creek, Pine Creek, Pope-Shenon, Quartz	Au, Ag, Cu, Pb, Zn, Co, WO ₃ , Fe, Mo, Sb, Ti, Th, Rare Earths, Monazite, Mica	2,754.7

See footnotes at end of table.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)—Continued

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
	Creek, Queen of the Hills, Rainbow, Rattlesnake, Ready Cash, Red Cross, Red Metal, Rico, Ringbone Cayuse, Robert's, Salmon Canyon, Silverton, Simer, Simplot Monazite, Sims, Smith Creek-Big Creek placers, Snowbird, Snowdrift, Snowshoe, Speculation, Spring Creek, Stibnite, Sunday, Sundown, Tendoy, Thomas-Herzog, Torney Copper, Twilight, U.P. & Burlington, Wagonhammer Gulch placer, Werdenhoff, Wickham, Yellow Jacket, Yellowjacket Mountains placer.		
34	Bohannon, Dark Horse, Goldbug, Goldstone, Hungry Hill, Kirtley, Oro Cache, Ranger, Silver Star, Virginia, War Eagle, White Horse.	Au, Ag, Cu, Pb	10.5
35	Parrot placer	Au	<1.0 ¹
36	Columbia, Comeback, Continental, Copper Glance, Diamond Queen, High Bar, Johnson Lode, Merrit, Meyers Cove, Rabbit Foot, Silver Creek, Singeiser-Monument, Snowstorm, Steen, Tin Cup, Yellowjacket.	Au, Ag, Cu, Pb, Zn, Fluorspar	370.2
37	Thorn Creek placers	Zircon	<1.0 ¹
38	Burnt Rock, Rose Marie, Vick Creek	Mn, Cr, Asbestos	>2.0 ²
39	Inspiration Barite	Barite	>1.0 ¹
40	Peck Mountain Copper	Cu, Au, Barite	>1.0 ¹
41	Brownlee Creek, Cuddy Mountain, Edna-May, Hercules, Keystone, Railroad.	Au, Ag, Cu, Pb, Zn, Fe	26.4
42	Gold Fork-Little Valley placer, Paddy Flat placer, West Mountain placers.	Ti, Th, Au, Nb, Zircon, Monazite	>3.0 ²
43	Big Chief, Old Faithful	WO ₃	<1.0 ¹
44	Lower's placer, Pistol Creek & Middle Fork Salmon placer, Pungo Creek.	Au, Fluorspar	>2.0 ¹
45	Aparejo Point placer, Sullivan	Au, Ag, Cu, Pb, Zn, U	<1.0 ¹
46	Iron Creek	Cu, Co, Au	>5.0 ^{1,2}
47	Harmony	Au, Ag, Cu	>1.0 ¹
48	Baby Joe, Blue Lead, Buckhorn, Commodore, Copper Carbonate, Copper Queen, Dictator, Dixie, Fishcan, Grizzly, Idaho Pride, Kimmel, Last Chance, Leadville, Lone Star, Maryland, No. 31 Thorium, Nuclear Fuels & Rare Metals, Peacock, Plymouth, Ramshorn, Scott, Spring Canyon.	Au, Ag, Cu, Pb, Zn, Th, Ti, U	8.2
49	Black Angus, Poison-McKim-Little Sawmill Creek	Fe	>6,000.0 ¹
50	Bluebird	Fe	
51	Black Hawk, Campbell Magnetite, Condor, Eagan, Enterprise, Gold Peak, Mortimer, Silver Still, Thorn Spring, Thorson Silica, Virginia L.	Au, Ag, Cu, Pb, Zn, Fe, Hg, Silica, Barite	1,693.9
52	Mica Queen	Mica	>1.0 ¹
53	Big Creek placers, Callender placer, Clear Creek placer, Corral Creek placer, Horsethief placer, Hull's Big Creek placer, Pearsol Creek placer, Scott Valley placer.	Monazite, Rare Earths, Nb, Ti, Th	124.7
54	Stolle Meadows placer	Monazite, Zircon	>4.0 ²
55	Cougar, Franklin D., Lucky Ladd	Au, Ag, Cu, Pb	>25.0 ¹
56	Bacon, Blackjack, Double Bar placer, East Transfer Bar placer, Golconda, Greyhound, Hardscrabble, Joe Bump Bar placer, Loon Creek placers, Lost Packer, Mountain King, Pinyon Silver, Star, Sunrise, Tin Cup Bar placer, West Tin Cup Bar placer, West Transfer Bar placer.	Au, Ag, Cu, Pb, Zn,	31.5
57	Falconberry Ranch placer	Au	<1.0 ¹
58	Parker, Williams	Au, Ag	<1.0 ¹
59	Blue Jay, Ima, Miller, Ray, Rosebud	Au, Ag, Cu, Pb, Zn, WO ₃	21.9
60	Blue Dog	Au, Ag	>180.0 ¹
61	Idaho-Almaden	Au, Hg	>750.0 ¹

See footnotes at end of table.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)—Continued

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
62	Christina	BeO	<1.0 ¹
63	Warm Springs	Ag, Pb	<1.0 ¹
64	Deadwood, Lost Pilgrim, Mary Jane, The Merry Blue, Whitehawk	Au, Ag, Cu, Pb, Zn, Nb, WO ₃ , Monazite	26.6
65	Bear Valley placers, Springfield Scheelite	Monazite, Zircon, Nb, WO ₃	>55.0 ²
66	Arcade, Badger, Buckskin, Charles Dickens, Charles Wain, Deer Strike, Dubuque, Elk Creek placer, Elk Creek, Enterprise, Fairplay, Fourth of July, General Custer, Giant Spar, Golden Gate, Golden Sunbeam, Grand Prize, Gray Eagle, Joe's Gulch placer, Jordan Creek placer, Julietta, Kraken Hill, Kwajalein, Letha, Lightning, Longview, Lucky boy, McFadden, Montana, Mountain Girl, Nip & Tuck, Payette placer, Rough Creek, Runover, Shorty, Shorty Graphite, Snowdrift, Stanley Creek placer, Sunrise, Sunset, Tonto, Upper Ten, Valley Creek, Valley Creek placers, Washington, Why Not, Yankee Fork placer.	Au, Ag, Cu, Pb, Zn, U, Rare Earths, Fluorspar, Graphite	527.6
67	Bayhorse Lead, Beardsley, Buckskin, Cal-Ida, Cave, Challis View, Clayton Silver, Clayton View, Compass, Democrat, Dougherty, Dryden, Elkhorn placer, Ella, Fluorspar, Forest Rose, Garden Creek, Hoosier, Keystone, Last Chance, Pacific Fluorspar, Ramshorn, Red Bird, Riverview, Rob-Roy, Saturday Mountain, Silver Bell, Silver Brick, Skylark, South Butte, Sure Shot, Tango, Thompson Creek, Thompson Creek Tungsten, Turtley, Twin Apex, William.	Au, Ag, Cu, Pb, Zn, Mo, WO ₃	5,587.3
68	Hard Scrabble, Lady May, Oregon	Au, Ag, Cu, Pb	<1.0 ¹
69	Allie, Brown Bull, Democrat, Elizabeth, Excelsior, Fairview, Galena, Gilmore, Grooms Democrat, Hilltop, Iron Mask, Jumbo, Latest Out, Lemhi, Little Hill, Mountain Boy, Murphy, Old Nicholas, Red Warrior, Ridgeway, Silver Consolidated, Silver Fissure, Silver Moon, Sims Magnetite, Wanda Loy, Winnie.	Au, Ag, Cu, Pb, Zn, Fe	510.6
70	Ida, Viola	Au, Ag, Cu, Pb, Zn	>1.0 ¹
71	Spencer Opal	Gem stone	>1.02
72	Miller Mountain	Au, Ag	<1.01
73	Gold Creek placer, Williams Creek placer	Rare Earths, Zircon, Monazite,	>60.0 ^{1,2}
74	Hoodoo, Lakeview, Little Boulder Creek, Little Livingston, Livingston, Silver Rule, Timberline.	Au, Ag, Cu, Pb, Zn, Sb, Mo, WO ₃ , Sn, Fluorspar, Nb	3,254.5
75	Badger Creek, Big Horn, Copper Mountain, Great Western, Pickup, White Bird, Wilbert.	Au, Ag, Cu, Pb, Zn	11.7
76	Birch Creek, Scott, Valley View, Worthing-Kaufman	Au, Ag, Cu, Pb, Zn	16.7
77	Birch Creek	Fe	<1.0 ¹
78	Alexander, Black Pearl, Checkmate, Dewey, Double Eagle, Friday, Gem Silica, Gold Digger, Hall's, Irondollar, IXL, Johnson Creek placer, Judas, Leviathan-Red Warrior, Lincoln, Nellie, Osborne, Pearl Silver, Pinto, Silver Spray.	Au, Ag, Cu, Pb, Zn, Silica, Monazite	22.2
79	Accident, Ader, Banner, Belshazzar, Big Ben, Birthday, Black Jack, Blaine, Blue Rock, boulder, Bruser, Buckskin, Canyon Creek, Cash Register, Cluverlead, Coin Bond, Comeback, Coon Dog, Crackerjack & Old Boston, Cumo, Disseminated Lead, Edna, Elk and Mores Creeks, Elkhorn, Enterprise, Gall Creek, Gambinus, Garden Valley placer, Gold Belt, Gold Dollar, Gold Hill, Gold Hill placers, Golden Chariot, Golden Cycle, Golden Dividend, Golden-Age, Grand View, Granger, Granite, Grimes Company placers, Grimes Pass, Halley placer, Hayfork, Homestake, Horse Shoe, Idaho, Illinois, Independence, J.S., K.C., King Solomon, Last Chance, Leary placer, Little Fall Creek, Lucky Boy, Mademoiselle, Mammoth, Mascot, Mattie, Mayflower, McKinley, Mineral Hill, Missouri,	Au, Ag, Cu, Pb, Zn, Monazite, Zircon	9,000.8

See footnotes at end of table.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)—Continued

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
	Mohawk, Monazite, Mores Creek, Morning Star Crossing, Mountain Chief, Mountain Queen, Moble, Oro, Quartzburg-Empire, Rabbit Creek placer, Reid placer, Silver Gem, Silver Star, Slopers Lode, Smuggler, Texida, Twin Sister, Washington.		
80	Atlanta, C & E, Gold Bug, Hermada, Little Queens, Lone Cabin, Magnolia Creek, Overlook, Rico, Vre Non placer.	Au, Ag, Pb, Zn, Sb	395.7
81	Baltimore, Big Lode, Boise Rochester, Golden Stinger, Last Chance, Minerva, Pal, Paymaster, Tahoma, Talache.	Au, Ag, Cu, Pb, WO ₃	128.4
82	Axolotl, Baltic, Blue Gem, Boyd, Columbia, Diamond Prince, E & D, El Oro, Golden Dawn, Lucky Boy, Mountain King, Old Sam, Pilgrim, Raymond & Aurora, Red Horse, Ross placer, Ruby, Sunbeam & Pride of the West, Tip Top, Vienna, Webfoot.	Au, Ag, Cu, Pb, Zn, BeO, Gem stone	9.0
83	Ajax, Alice, Allen, Alta Silver, Alto Silver Quartz, Amicus, Arizona, Arkoosh, Baltimore, Big Doe, Big Five, Big John, Black Barb, Black Carbonate, Blue Kitten, Bonnie Barite, Boulder, Bullion, Bullwhacker, Buttercup, Camas, Camp Creek placer, Champlain, Chief, Clearwater & Wolverine, Climax, Coffee Pot, Comet, Confidence, Croesus, Deer Trail, Democrat, Edres, Elkhorn, Falling Star-West Pass, Fifty-Fifty, Fourth of July, Galena, Gamable, Grover Crocker, Happy Day, Hard Times, Hattie, Heine, Hidden Treasure, High Grade, Highland Chief, Hillside, Homestake, Horseshoe, Idahoan & Old Bible Back, Imperial, Independence, Jankow, Jay Gould, Jennie R., Jensen-Stevens, John Crist, Jumbo, June Day, Keystone, Lake, Lark, Last Chance, Le Grande, Leilani, Liberty Gem, Little Falls Creek, Little Hilman, Lodgepole, Long Grade, Long Trail, Lookout Mountain, Lost Dump, Lucky Boy, Lucky G.I., Lucky, Magdalena, Maggie, Mascot, Mattair-Powell, Mattie, Mayflower, McCoy, Meadowview, Memorial, Million, Minnie Moore, Modoc Chief, Murphy & Davis, Narrow Gauge, Nay-Aug, New Hope, New York-Idaho, North Star, Ohio, Ophir, Oriental, Oswego, Pass, Phi Kappa, Pine Mouse, Poverty Flats placer, Princess, Purple Spar, Ouaker City, Ouigley, Rattle, Reconstruction Vein, Red Cloud, Red Elephant, Red Jack, Red Leaf, Red Robin, Red Rock, Rock Creek, Rupert, Rustler, Senate, Silver Bell, Silver Cord, Silver Eagle, Silver Mountain, Silver Star Queens, Silver Wing, Snoose, Star, Star No. 1, Stoneboat, Storm Petrel, Sun Valley Barite, Sunshine, Tip-Top, Tom Boy, Triumph, Utah-Bellevue, Valley View, Walton Moly, War Dance, Washington, West Fork, Westlake, White Elephant West, Wildhorse, Wolfstone.	Au, Ag, Cu, Pb, Zn, WO ₃ , Barite, Zircon, Fluorspar, Mo, Sn	1,201.7
84	Blue Bird, Champion, Empire, Gamebet, Grand Prize, Hanni, Horseshoe, Kennedy Lead, Saddle Magnetite, Silver King, Tiger, White Knob.	Au, Ag, Cu, Pb, Zn, Fe, WO ₃	16,286.8
85	Blackhawk, Copper Basin, Eagle Bird, Garfield Antimony & Scorpion, Garfield, Gray Eagle, Idaho Muldoon, Mackinaw, Monarch, Muldoon, Mutual, Rippetto, Silver King, Silver Spar, White Cloud.	Au, Ag, Cu, Pb, Zn, Barite	81.5
86	Ella, Hornsilver, Hub, Last Chance, Lead Belt, Markell, Martin, Pandora, Paymaster, Silver Bell, Zinc-Clarke.	Au, Ag, Cu, Pb, Zn, Mn	5.4
87	Adelmann, Black Hornet, Golden Star, Last Hope, Picket Pin, Twentieth Century, Wild Cat.	Au, Ag, Cu, Pb	0.1
88	Blue Cloud	BeO	<1.0 ²

See footnotes at end of table.

Table G-1.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected locatable minerals (in 1981 dollars)—Continued

Map resources	Mine or deposit name	Commodities	Production and/or identified resources, million \$
89	Bonaparte, Clifton Bell, Commonwealth, Dismal Swamp placer, Elmore, Empire, Feather River placer, Idaho Gold Chief, Independence, Keystone, Lison, Ophir, Passover, Rocky Bar, Vibrator, Vishnu, West Ophir, Wide West.	Au, Ag, Pb, U, Nb	9.3
90	Carrie Leonard, Climax, Dollarhide, Hidden Treasure, Idaho Chief, Isabella, Jane Lee, King of the West, Perseverance, Silver Star, Smokey Bullion, Stormy Galore, Taft.	Au, Ag, Cu, Pb, Zn	18.8
91	Bonnie Anna, Franklin	Au, Ag	<1.0 ¹
92	Index	Au, Ag	<1.0 ¹
93	Addie Consolidated, Banner, Bergh-Sunnyside, BH, Black Jack, Boulder Creek, Browney, Brunzell, Cosmopolitan, Crown Point, Cumberland, Delamar, DeLamar Silver, Dewey, Empire, Empire State, Garfield, Gold Bug, Golden Chariot, Golden Gate, Homestake, Ida Belle, Iva Grace, Jordan Creek placer, Lindy, Morning Star, Mountain Chief, Nellie Ann, Never Sweat, Ontario, Oro Fino, Pauper, Perseverance, Poorman, Potosi, Ruth, Silver Burg, Silver City, Sommercamp, Sunnyside, Tango, Tip Top, Trade Dollar, Village Blacksmith, White Horse.	Au, Ag, Cu, Pb, Zn, Hg	1,231.7
94	Pyramid placer	Au, Ag	<1.0 ¹
95	Golden Crown	Au, Ag, Pb	<1.0 ¹
96	Independence, South Mountain, Standard	Au, Ag, Cu, Pb, Zn	>15.0 ¹
97	Lucky Strike placer, Monte Cristo, Paymaster, Pittsburg, Robinson.	Au, Ag, Cu	<0.1
98	Belle Marsh, Fort Hall, Inkom Silica, Kit, Kopper King, Mink Creek, Moonlight.	Au, Ag, Cu, Pb, Silica	3.0
99	Bonanza Bar placer	Au	<1.0 ¹
100	Vanza	Mn	<1.0 ¹
101	Monsanto Quartzite	Silica	>1.0 ²
102	Old Dominion	Ag, Cu, Pb, Zn	<1.0 ¹
103	Albion, Big Bertha, Flagstaff, Golden Eagle, Melcher	Au, Ag, Cu, Pb	1.4
104	Cleveland	Mn	>1.0 ¹
105	Bonanza	Ag, Cu	<1.0 ¹
106	Blackstone, Humming Bird, Sunset	Au, Ag, Cu, Pb	<5.0 ¹
107	Goose Creek Basin, Hazel Pine, Idaho Quartzite, Tolman, Valentine.	Au, Ag, Cu, Pb, Zn, Hg, Pumice, Silica	147.7

¹Actual value withheld to protect confidentiality.

²Estimated value only.

Table G-2.—Mineral production and/or identified resources used to estimate boundaries of Known Mineral Deposit Areas for selected leasable minerals (in 1981 dollars)

Map	Mine or deposit name	Commodities	Production and/or identified resources, million \$
1 . . .	Big Bear Creek, Dry Canyon, Hawley Creek	P ₂ O ₅ , V	W ¹
2 . . .	Centennial	P ₂ O ₅	W
3 . . .	Prospectively valuable area ²	P ₂ O ₅	W
4 . . .	Prospectively valuable area	P ₂ O ₅	W
5 . . .	Prospectively valuable area	P ₂ O ₅	W
6 . . .	Prichard Creek, Swan Valley	P ₂ O ₅	W
7 . . .	Gay	P ₂ O ₅	W
8 . . .	Ballard, Blackfoot Bridge, Central Farmers, Caldwell Canyon, Champ, Conda, Diamond Creek, Dry Valley, Enoch Valley, Henry, Husky No. 1, J.A. Terteling, Lanes Creek, Maybe Canyon, Middle Sulfur Canyon, Mountain Fuel, North Trail, Canyon, Rasmussen Ridge, Smoky Canyon, Swan Lake Gulch, Trail Creek, Wooly Valley.	P ₂ O ₅ , V	W
9 . . .	Prospectively valuable area	P ₂ O ₅	W
10 . .	Prospectively valuable area	P ₂ O ₅	W
11 . .	Prospectively valuable area	P ₂ O ₅	W

¹Actual values withheld to protect confidentiality.

²Prospectively valuable areas identified from BLM mineral classification maps.

APPENDIX H.—ANNUAL PRICE AND PRODUCTION FOR GOLD, SILVER, COPPER, LEAD, AND ZINC IN IDAHO (1863-1988)

The following tables were compiled by Gerald Klett from Bureau records and other sources. The annual production figures are shown in table H-1. The prices are average annual prices for each year (table H-2). Production figures prior to 1883 are questionable because not all mines reported their production; estimates were made

by State or Federal mineral specialists. Production data represented by a W are withheld where production from one or two mines constitute the total production of a commodity and disclosure would breach the Bureau's policy regarding company confidentiality.

Table H-1.—Idaho production of gold, silver, copper, lead, and zinc: 1863-1988

Year	Gold, tr oz	Silver, tr oz	Copper, st	Lead, st	Zinc, st	Year	Gold, tr oz	Silver, tr oz	Copper, st	Lead, st	Zinc, st
1863	326,531	185,874				1910	50,112	7,027,000	3,519	114,129	2,802
1864	300,897	185,874				1911	65,688	8,184,900	2,576	136,278	4,170
1865	303,863	224,383				1912	67,810	7,862,900	3,746	142,093	6,953
1866	373,634	224,048				1913	60,193	9,477,100	4,796	158,936	11,587
1867	299,925	225,564				1914	57,431	12,573,800	3,223	174,263	21,006
1868	319,275	301,659				1915	56,628	13,042,466	3,489	173,000	35,077
1869	309,600	452,830	4			1916	51,195	11,570,399	4,239	187,541	43,253
1870	266,062	376,506				1917	36,511	11,402,542	3,914	196,780	39,927
1871	212,850	452,830				1918	33,930	9,396,009	3,267	147,348	22,581
1872	111,262	309,382				1919	34,085	5,933,076	1,561	91,171	7,997
1873	93,847	431,766				1920	22,668	7,364,785	1,269	124,805	13,966
1874	64,339	430,360				1921	26,229	7,200,319	844	99,234	17
1875	74,981	161,290		200		1922	22,891	5,791,413	1,641	97,917	2,054
1876	67,725	172,414				1923	35,764	8,019,977	1,990	121,178	13,976
1877	75,454	193,364				1924	27,085	8,036,338	1,370	124,475	7,670
1878	60,320	154,691				1925	19,974	7,663,437	1,649	126,521	15,619
1879	58,050	502,746				1926	12,640	7,563,644	668	136,490	26,307
1880	95,783	348,055		150		1927	15,209	8,928,619	1,087	151,019	26,778
1881	82,237	1,005,492		1,450		1928	20,351	8,949,716	1,036	145,323	31,263
1882	72,562	1,546,910		5,000		1929	19,597	9,533,327	2,566	148,695	45,675
1883	67,725	1,624,256		6,000		1930	21,198	9,710,150	1,555	134,058	37,649
1884	60,469	2,103,798	23	7,500		1931	18,361	7,220,923	572	99,365	19,569
1885	87,075	2,707,093	20	7,940		1932	46,885	6,716,968	572	72,118	10,252
1886	87,075	2,784,438		20,672		1933	64,592	6,987,960	781	74,363	20,968
1887	91,921	2,320,365		25,668		1934	84,817	7,394,143	766	71,324	24,799
1888	116,100	2,320,313	25	35,000		1935	83,823	10,240,953	1,048	79,020	31,053
1889	96,750	3,400,000	78	23,172		1936	80,291	14,537,530	1,477	91,339	49,100
1890	89,494	3,700,000	44	32,500		1937	82,861	19,587,766	2,232	103,711	54,199
1891	81,270	4,035,000	73	38,562		1938	103,513	18,993,676	2,139	92,177	44,030
1892	83,271	3,164,269	113	25,661		1939	116,662	17,222,370	2,516	90,981	47,549
1893	79,669	3,910,700	18	36,068		1940	146,480	17,552,240	3,349	104,834	70,601
1894	100,682	3,288,548		37,221		1941	149,816	16,672,410	3,621	104,914	79,084
1895	86,088	3,110,600	713	32,876		1942	95,020	14,644,890	3,430	113,909	87,256
1896	104,263	5,149,900		49,223		1943	30,808	11,700,180	2,324	96,457	86,707
1897	82,320	4,901,200	92	64,304		1944	25,008	9,931,614	1,688	83,530	91,372
1898	83,055	5,073,800	633	61,240		1945	17,780	8,142,667	1,548	68,447	83,463
1899	91,380	3,851,800	55	52,374		1946	42,975	6,491,104	1,038	59,987	71,507
1900	83,433	6,429,100	145	85,444		1947	64,982	10,345,779	1,640	78,944	83,069
1901	90,427	5,542,900	240	81,277		1948	58,454	11,448,875	1,624	88,544	86,267
1902	71,352	5,854,800	114	64,303		1949	77,829	10,049,257	1,438	79,299	76,555
1903	75,969	6,507,400	390	106,572		1950	79,652	16,095,019	2,107	100,025	87,890
1904	72,742	7,810,200	1,079	116,548	1	1951	45,064	14,753,023	2,160	76,713	78,121
1905	52,032	8,125,600	3,661	129,906	614	1952	32,997	14,923,165	3,213	73,719	74,317
1906	50,102	8,836,200	4,779	127,507	1,033	1953	17,630	14,639,740	3,136	74,610	72,153
1907	60,754	7,888,400	5,446	116,912	3,493	1954	13,245	15,867,414	4,828	69,302	61,528
1908	69,829	7,558,300	5,021	103,414	19	1955	10,572	13,831,458	5,618	64,163	53,314
1909	65,026	6,755,900	4,558	107,993	676	1956	9,210	13,471,916	6,656	64,321	49,561

Table H-1.—Idaho production of gold, silver, copper, lead, and zinc: 1863-1988—Continued

Year	Gold, tr oz	Silver, tr oz	Copper, st	Lead, st	Zinc, st	Year	Gold, tr oz	Silver, tr oz	Copper, st	Lead, st	Zinc, st
1957	12,301	15,067,420	7,912	71,637	57,831	1973	2,696	13,619,824	2,625	61,744	46,107
1958	15,896	15,952,796	9,846	53,603	49,725	1974	2,898	12,435,701	2,841	51,717	39,469
1959	10,479	16,636,486	8,713	62,395	55,699	1975	2,529	13,868,133	3,192	50,406	40,934
1960	6,135	13,646,508	4,208	42,907	36,801	1976	2,755	11,561,421	3,363	53,647	46,595
1961	5,718	17,576,322	4,328	71,476	58,295	1977	12,894	15,291,964	4,053	47,268	31,004
1962	5,854	17,772,435	3,861	84,058	62,865	1978	20,492	18,379,417	4,287	49,351	35,670
1963	5,477	16,710,725	4,172	75,759	63,267	1979	24,140	17,144,208	3,989	47,008	32,701
1964	5,677	16,483,495	4,666	71,312	59,298	1980	W	13,694,902	3,421	42,566	30,564
1965	5,078	18,456,809	5,140	66,606	58,034	1981	W	16,545,648	4,680	42,334	W
1966	5,056	19,776,785	4,961	72,334	60,997	1982	W	14,830,351	3,389	W	W
1967	4,838	17,033,330	4,210	61,387	56,528	1983	W	17,694,276	3,921	28,548	W
1968	3,227	15,958,715	3,525	54,790	57,248	1984	W	18,869,186	4,080	W	W
1969	3,403	18,929,697	3,332	65,597	55,900	1985	44,306	18,827,948	3,915	37,163	W
1970	3,128	19,114,829	3,612	61,211	41,052	1986	70,440	11,206,851	W	10,971	387
1971	3,596	19,139,575	3,776	66,610	45,078	1987	97,773	W	W	W	W
1972	2,884	14,250,725	2,942	61,407	38,647	1988	103,453	10,934,631	2,500	W	W

W Withheld to avoid disclosure of company proprietary data.

Table H-2.—Average prices of gold, silver, copper, lead, and zinc: 1863-1988

Year	Gold, \$/tr oz	Silver, \$/tr oz	Copper, \$/lb	Lead, \$/lb	Zinc, \$/lb	Year	Gold, \$/tr oz	Silver, \$/tr oz	Copper, \$/lb	Lead, \$/lb	Zinc, \$/lb
1863	20.67	1.345	0.340	0.060	--	1921	20.67	1.000	0.129	0.045	0.050
1864	20.67	1.345	.470	.070	0.139	1922	20.67	1.000	.135	.055	.057
1865	20.67	1.338	.393	.066	--	1923	20.67	.820	.147	.070	.068
1866	20.67	1.339	.343	.070	--	1924	20.67	.670	.131	.080	.065
1867	20.67	1.328	.254	.065	--	1925	20.67	.694	.142	.087	.076
1868	20.67	1.326	.230	.065	--	1926	20.67	.624	.140	.080	.075
1869	20.67	1.325	.243	.060	--	1927	20.67	.567	.131	.063	.064
1870	20.67	1.328	.212	.060	--	1928	20.67	.585	.144	.058	.061
1871	20.67	1.326	.241	.060	--	1929	20.67	.533	.176	.063	.066
1872	20.67	1.322	.356	.064	--	1930	20.67	.385	.130	.055	.046
1873	20.67	1.298	.280	.060	--	1931	20.67	.287	.091	.042	.036
1874	20.67	1.279	.220	.060	--	1932	20.67	.279	.063	.032	.029
1875	20.67	1.242	.227	.058	.070	1933	25.56	.347	.064	.039	.040
1876	20.67	1.164	.210	.061	.072	1934	34.95	.646	.080	.039	.042
1877	20.67	1.202	.190	.055	.060	1935	35.00	.719	.083	.046	.043
1878	20.67	1.154	.166	.036	.049	1936	35.00	.775	.092	.047	.049
1879	20.67	1.124	.186	.041	.052	1937	35.00	.774	.121	.060	.065
1880	20.67	1.145	.214	.050	.055	1938	35.00	.646	.098	.047	.046
1881	20.67	1.132	.182	.048	.052	1939	35.00	.678	.104	.050	.051
1882	20.67	1.136	.191	.049	.053	1940	35.00	.711	.113	.051	.063
1883	20.67	1.109	.165	.043	.045	1941	35.00	.711	.118	.058	.075
1884	20.67	1.111	.130	.037	.044	1942	35.00	.711	.118	.065	.083
1885	20.67	1.065	.108	.040	.043	1943	35.00	.711	.118	.065	.083
1886	20.67	.995	.111	.046	.044	1944	35.00	.711	.118	.065	.083
1887	20.67	.979	.138	.045	.046	1945	35.00	.711	.118	.065	.083
1888	20.67	.940	.168	.044	.049	1946	35.00	.808	.144	.081	.087
1889	20.67	.935	.135	.039	.050	1947	35.00	.905	.209	.147	.105
1890	20.67	1.046	.156	.045	.055	1948	35.00	.905	.217	.080	.136
1891	20.67	.988	.128	.043	.050	1949	35.00	.905	.197	.154	.122
1892	20.67	.871	.116	.041	.046	1950	35.00	.905	.208	.133	.139
1893	20.67	.780	.108	.037	.040	1951	35.00	.905	.242	.175	.180
1894	20.67	.635	.095	.033	.035	1952	35.00	.905	.242	.165	.162
1895	20.67	.654	.107	.032	.036	1953	35.00	.905	.287	.135	.109
1896	20.67	.676	.108	.030	.039	1954	35.00	.905	.295	.141	.107
1897	20.67	.604	.120	.036	.041	1955	35.00	.905	.373	.151	.123
1898	20.67	.590	.124	.038	.046	1956	35.00	.905	.425	.160	.135
1899	20.67	.602	.171	.045	.058	1957	35.00	.905	.301	.147	.114
1900	20.67	.620	.166	.044	.044	1958	35.00	.905	.263	.121	.103
1901	20.67	.596	.167	.043	.041	1959	35.00	.905	.307	.122	.115
1902	20.67	.528	.122	.041	.048	1960	35.00	.905	.321	.120	.130
1903	20.67	.543	.137	.042	.054	1961	35.00	.924	.300	.109	.116
1904	20.67	.579	.128	.043	.051	1962	35.00	1.085	.308	.096	.116
1905	20.67	.610	.156	.047	.059	1963	35.00	1.279	.308	.111	.120
1906	20.67	.677	.193	.057	.061	1964	35.00	1.293	.326	.136	.136
1907	20.67	.662	.200	.053	.059	1965	35.00	1.293	.354	.160	.145
1908	20.67	.535	.132	.042	.047	1966	35.00	1.293	.366	.151	.145
1909	20.67	.520	.130	.043	.054	1967	35.00	1.550	.386	.140	.139
1910	20.67	.541	.127	.044	.054	1968	39.26	2.144	.422	.132	.135
1911	20.67	.539	.125	.045	.057	1969	41.51	1.790	.479	.149	.147
1912	20.67	.615	.165	.045	.069	1970	36.41	1.771	.582	.157	.153
1913	20.67	.605	.155	.044	.056	1971	41.52	1.542	.520	.139	.161
1914	20.67	.553	.133	.039	.051	1972	58.60	1.685	.512	.150	.178
1915	20.67	.507	.175	.047	.124	1973	97.81	2.558	.595	.163	.207
1916	20.67	.658	.246	.069	.134	1974	159.74	4.708	.773	.225	.340
1917	20.67	.824	.273	.086	.102	1975	169.49	4.418	.642	.215	.390
1918	20.67	1.000	.247	.071	.091	1976	125.32	4.354	.696	.231	.370
1919	20.67	1.120	.186	.053	.073	1977	148.31	4.623	.668	.307	.344
1920	20.67	1.090	.184	.080	.081	1978	193.55	5.401	.655	.337	.310

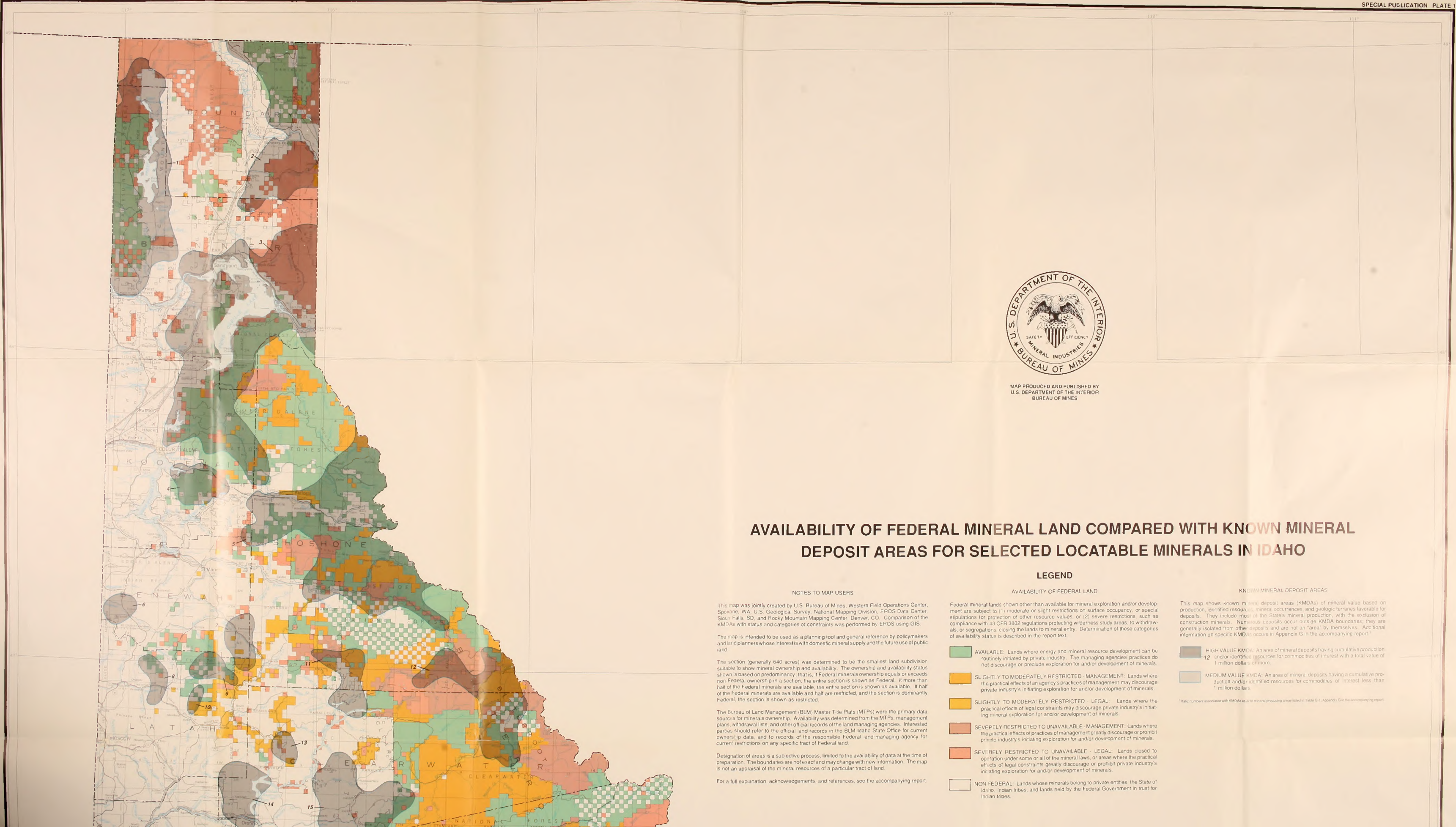
Table H-2.—Average prices of gold, silver, copper, lead, and zinc: 1863-1988—Continued

Year	Gold, \$/tr oz	Silver, \$/tr oz	Copper, \$/lb	Lead, \$/lb	Zinc, \$/lb	Year	Gold, \$/tr oz	Silver, \$/tr oz	Copper, \$/lb	Lead, \$/lb	Zinc, \$/lb
1979	307.50	11.090	0.922	0.526	0.373	1984	360.66	8.140	0.668	0.256	0.486
1980	612.56	20.630	1.013	.425	.374	1985	317.66	6.140	.700	.191	.404
1981	459.64	10.520	.842	.365	.446	1986	368.24	5.470	.661	.220	.380
1982	375.91	7.950	.728	.255	.385	1987	444.00	7.200	.800	.360	.416
1983	424.00	11.440	.765	.217	.414	1988	438.31	6.540	1.205	.371	.602

Sources: U.S. Treasury Department. Annual Report of the Director of the Mint. 1914, pp. 212-213; U.S. Department of Commerce. Mineral Resources of the United States - 1929 - Part I-Metals. BuMines, 1932, p. a123; Bell, James E., Silver. Ch. in Mineral Facts and Problems. BuMines B 556, 1956, p. 791; U.S. Bureau of Mines. Mineral Yearbooks 1932-88; U.S. Bureau of Mines. Mineral Commodity Summaries 1989.

Plate 1.—Availability of Federal mineral land compared with known mineral deposit areas for selected locatable minerals in Idaho.

Plate 2.—Availability of Federal mineral land compared with known mineral deposit areas for selected leasable minerals in Idaho.



MAP PRODUCED AND PUBLISHED BY
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AVAILABILITY OF FEDERAL MINERAL LAND COMPARED WITH KNOWN MINERAL DEPOSIT AREAS FOR SELECTED LOCATABLE MINERALS IN IDAHO

LEGEND

NOTES TO MAP USERS

This map was jointly created by U.S. Bureau of Mines, Western Field Operations Center, Spokane, WA; U.S. Geological Survey, National Mapping Division, EROS Data Center, Sioux Falls, SD, and Rocky Mountain Mapping Center, Denver, CO. Comparison of the KMDAs with status and categories of constraints was performed by EROS using GIS.

The map is intended to be used as a planning tool and general reference by policymakers and land planners whose interests with domestic mineral supply and the future use of public land.

The section (generally 640 acres) was determined to be the smallest land subdivision suitable to show mineral ownership and availability. The ownership and availability status shown is based on predominance; that is, if Federal minerals ownership equals or exceeds non-Federal ownership in a section, the entire section is shown as Federal. If more than half of the Federal minerals are available, the entire section is shown as available. If half of the Federal minerals are available and half are restricted, and the section is dominantly Federal, the section is shown as restricted.

The Bureau of Land Management (BLM) Master Title Plats (MTPs) were the primary data sources for mineral ownership. Availability was determined from the MTPs, management plans, withdrawal lists, and other official records of the land managing agencies. Interested parties should refer to the official land records in the BLM Idaho State Office for current ownership data, and to records of the responsible Federal land-managing agency for current restrictions on any specific tract of Federal land.

Designation of areas is a subjective process, limited to the availability of data at the time of preparation. The boundaries are not exact and may change with new information. The map is not an appraisal of the mineral resources of a particular tract of land.

For a full explanation, acknowledgements, and references, see the accompanying report.

AVAILABILITY OF FEDERAL LAND

Federal mineral lands shown other than available for mineral exploration and/or development are subject to (1) moderate or slight restrictions on surface occupancy, or special stipulations for protection of other resource values, or (2) severe restrictions, such as compliance with 43 CFR 3802 regulations protecting wilderness study areas; to withdrawals, or segregations, closing the lands to mineral entry. Determination of these categories of availability status is described in the report text.

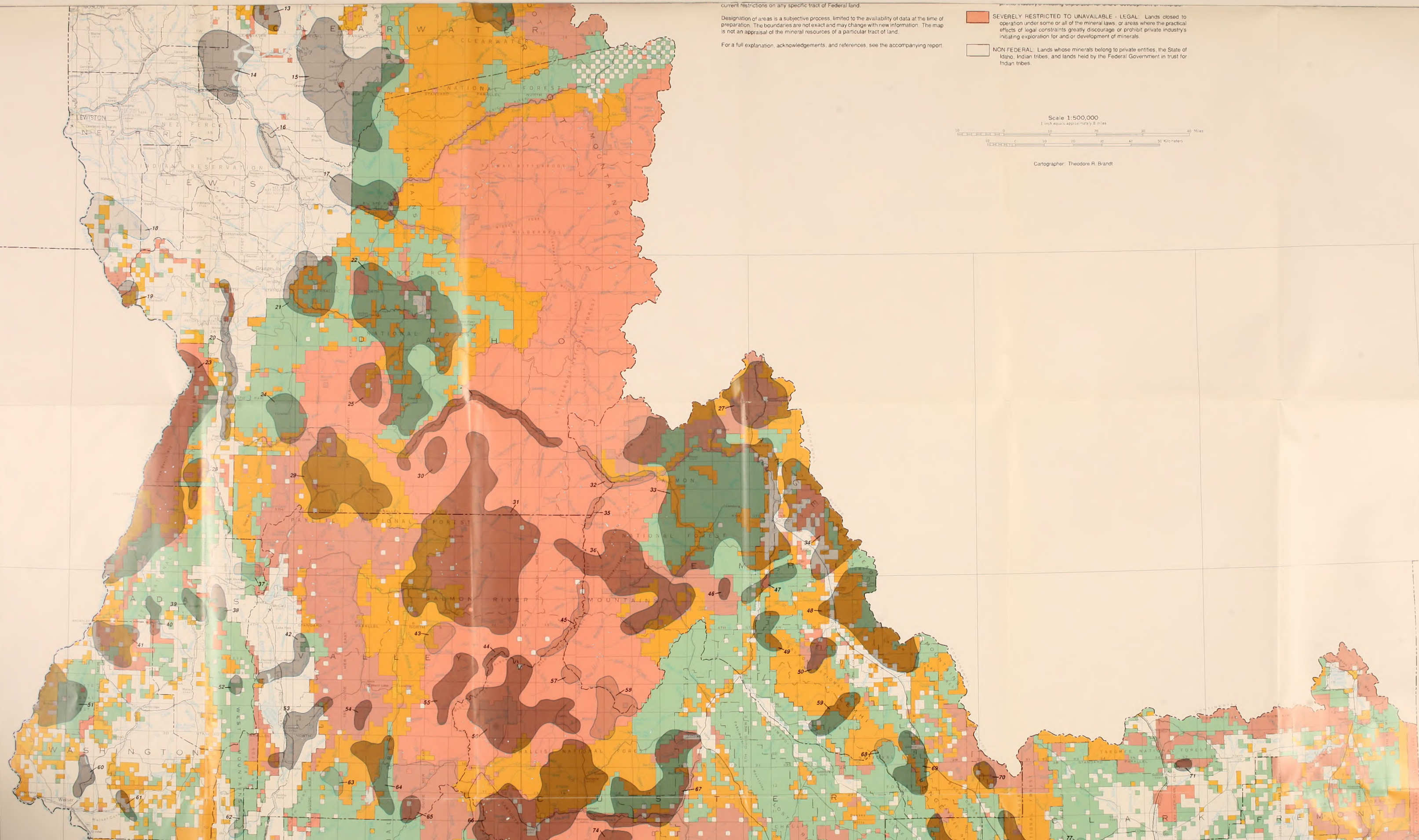
- AVAILABLE:** Lands where energy and mineral resource development can be routinely initiated by private industry. The managing agencies' practices do not discourage or preclude exploration for and/or development of minerals.
- SLIGHTLY TO MODERATELY RESTRICTED - MANAGEMENT:** Lands where the practical effects of an agency's practices of management may discourage private industry's initiating exploration for and/or development of minerals.
- SLIGHTLY TO MODERATELY RESTRICTED - LEGAL:** Lands where the practical effects of legal constraints may discourage private industry's initiating mineral exploration for and/or development of minerals.
- SEVERELY RESTRICTED TO UNAVAILABLE - MANAGEMENT:** Lands where the practical effects of practices of management greatly discourage or prohibit private industry's initiating exploration for and/or development of minerals.
- SEVERELY RESTRICTED TO UNAVAILABLE - LEGAL:** Lands closed to operation under some or all of the mineral laws, or areas where the practical effects of legal constraints greatly discourage or prohibit private industry's initiating exploration for and/or development of minerals.
- NON-FEDERAL:** Lands whose minerals belong to private entities, the State of Idaho, Indian tribes, and lands held by the Federal Government in trust for Indian tribes.

KNOWN MINERAL DEPOSIT AREAS

This map shows known mineral deposit areas (KMDAs) of mineral value based on production, identified resources, mineral occurrences, and geologic terranes favorable for deposits. They include most of the State's mineral production, with the exclusion of construction minerals. Numerous deposits occur outside KMDA boundaries; they are generally isolated from other deposits and are not an "area" by themselves. Additional information on specific KMDAs occurs in Appendix G in the accompanying report.¹

- HIGH VALUE KMDA:** An area of mineral deposits having cumulative production **12** and/or identified resources for commodities of interest with a total value of 1 million dollars or more.
- MEDIUM VALUE KMDA:** An area of mineral deposits having a cumulative production and/or identified resources for commodities of interest less than 1 million dollars.

¹ Basic numbers associated with KMDAs relate to mineral producing areas listed in Table G-1, Appendix G in the accompanying report.



current restrictions on any specific tract of Federal land.

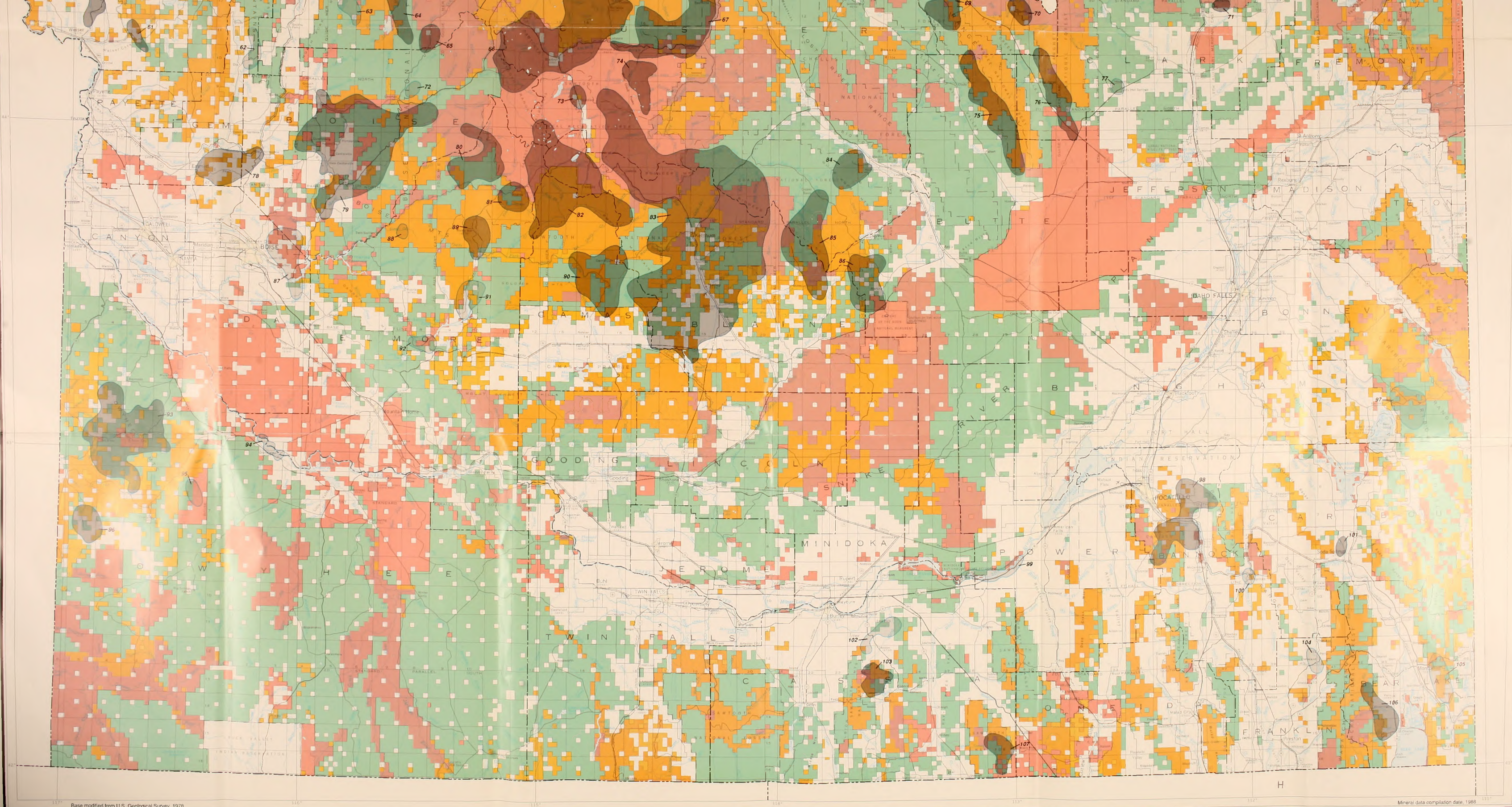
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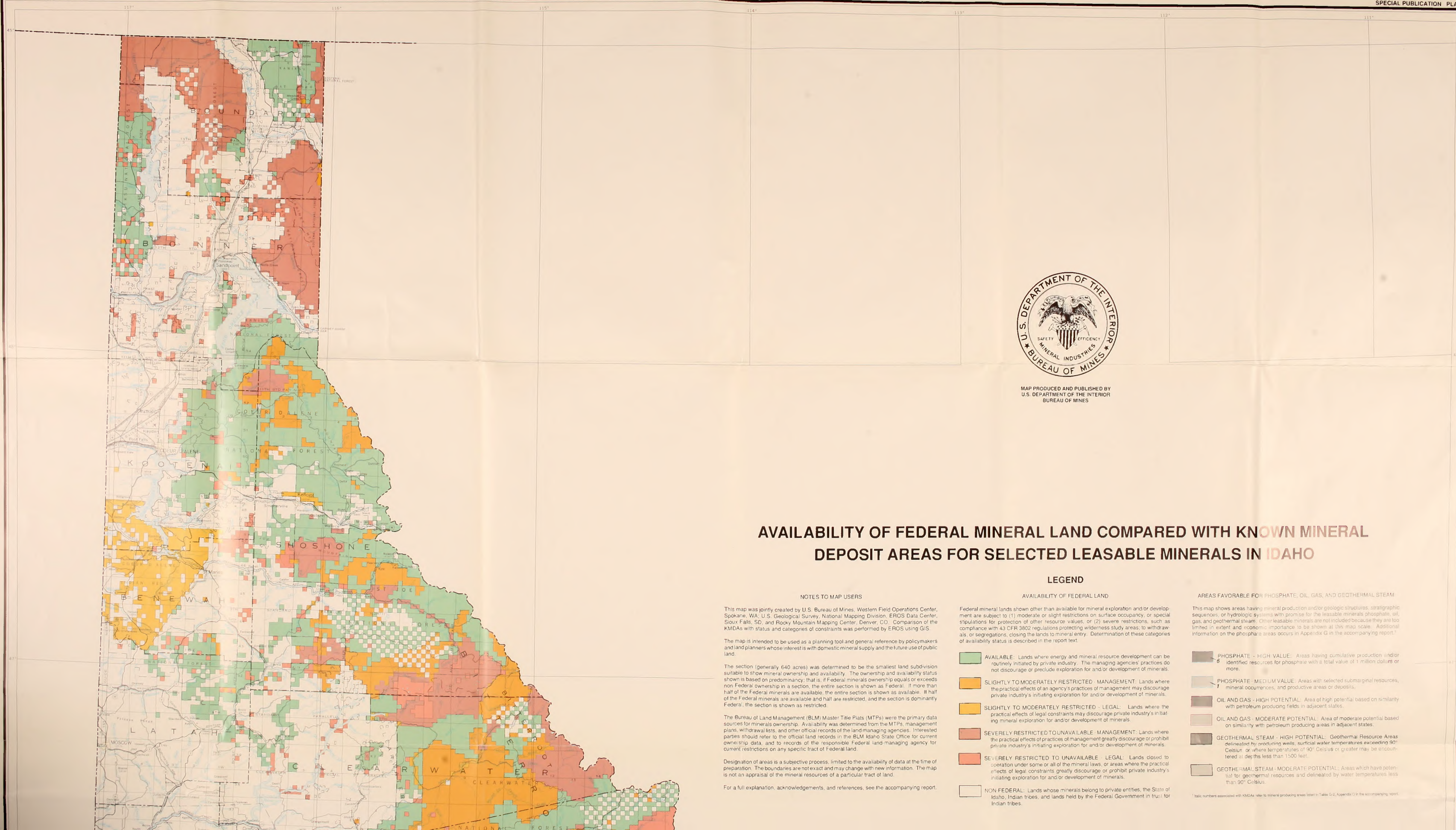
For a full explanation, acknowledgements, and references, see the accompanying report.

- SEVERELY RESTRICTED TO UNAVAILABLE - LEGAL: Lands closed to operation under some or all of the mineral laws, or areas where the practical effects of legal constraints greatly discourage or prohibit private industry's initiating exploration for and/or development of minerals.
- NON-FEDERAL: Lands whose minerals belong to private entities, the State of Idaho, Indian tribes, and lands held by the Federal Government in trust for Indian tribes.



Cartographer: Theodore R. Brandt





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LEGEND

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AVAILABILITY OF FEDERAL LAND

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- SLIGHTLY TO MODERATELY RESTRICTED - MANAGEMENT:** Lands where the practical effects of an agency's practices of management may discourage private industry's initiating exploration for and/or development of minerals.
- SLIGHTLY TO MODERATELY RESTRICTED - LEGAL:** Lands where the practical effects of legal constraints may discourage private industry's initiating mineral exploration for and/or development of minerals.
- SEVERELY RESTRICTED TO UNAVAILABLE - MANAGEMENT:** Lands where the practical effects of practices of management greatly discourage or prohibit private industry's initiating exploration for and/or development of minerals.
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- NON-FEDERAL:** Lands whose minerals belong to private entities, the State of Idaho, Indian tribes, and lands held by the Federal Government in trust for Indian tribes.

AREAS FAVORABLE FOR PHOSPHATE, OIL, GAS, AND GEOTHERMAL STEAM

This map shows areas having mineral production and/or geologic structures, stratigraphic sequences, or hydrologic systems with promise for the leasable minerals phosphate, oil, gas, and geothermal steam. Other leasable minerals are not included because they are too limited in extent and economic importance to be shown at this map scale. Additional information on the phosphate areas occurs in Appendix G in the accompanying report.¹

- PHOSPHATE - HIGH VALUE:** Areas having cumulative production and/or identified resources for phosphate with a total value of 1 million dollars or more.
- PHOSPHATE - MEDIUM VALUE:** Areas with selected submarginal resources, mineral occurrences, and productive areas or deposits.
- OIL AND GAS - HIGH POTENTIAL:** Area of high potential based on similarity with petroleum producing fields in adjacent states.
- OIL AND GAS - MODERATE POTENTIAL:** Area of moderate potential based on similarity with petroleum producing areas in adjacent states.
- GEOTHERMAL STEAM - HIGH POTENTIAL:** Geothermal Resource Areas delineated by producing wells, surficial water temperatures exceeding 90° Celsius, or where temperatures of 90° Celsius or greater may be encountered at depths less than 1500 feet.
- GEOTHERMAL STEAM - MODERATE POTENTIAL:** Areas which have potential for geothermal resources and delineated by water temperatures less than 90° Celsius.

¹ Static numbers associated with KMDAs refer to mineral producing areas listed in Table G-2, Appendix G in the accompanying report.

